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OF

MEDICAL SCIENCE.

EDITED BY

SIR JOHN W. MOORE, M.A., M.D., M.Ch. Dubl., D.Sc. Oxon.,

PAST-PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS OF IRELAND,
SENIOR PHYSICIAN TO THE MEATH HOSPITAL AND COUNTY DUBLIN INFIRMARY,
CONSULTING PHYSICIAN TO CORK-STREET FEVER HOSPITAL,
EX-SCHOLAR AND DIPLOMATE IN STATE MEDICINE
OF TRINITY COLLEGE, DUBLIN
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MEDICAL SCIENCE.

JANUARY 1, 1919.

PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*The Clinical Results of Poisoning by Mustard Gas.*[a] By T. GILLMAN MOORHEAD, M.D., Univ. Dubl.; F.R.C.P.I.; late Temp. Lieut.-Col., R.A.M.C.; Physician to the Royal City of Dublin Hospital.

IT is generally believed that the first introduction as a weapon of war by the Germans of the substance which is now known by our troops as "Mustard Gas," was about the middle of July, 1917. Personally I think that it had in all probability been used to some slight extent before that, inasmuch as a patient was admitted to my ward in Baggot Street Hospital towards the end of June, who presented symptoms similar to those with which I later became very familiar in France, but apparently it was not used on anything like a large scale until about July the 12th.

Mustard Gas or di-chlor-ethyl-sulphide $\begin{matrix}(CH_2Cl.CH_2)\\(CH_2Cl.CH_2)\end{matrix}$ S was prepared by von Meyer thirty years ago. Professor Werner, to whom I am indebted for this statement, also informs me that it is an oily liquid, having a slight sweetish or ethereal odour, like pineapple, according to

[a] Read before the Section of Medicine in the Royal Academy of Medicine in Ireland on Friday, January 18, 1918.

some of our troops, though the majority assign to it a slight mustard flavour. It boils at 217° C. and is almost insoluble in water. It was early shown to have very poisonous properties. A rabbit exposed to air previously passed over filter paper saturated with the substance died in three days, while in man it was found to cause extreme inflammation and suppuration when in contact with the skin, and intense irritation of the respiratory tract when breathed. The compound is probably decomposed in contact with the skin, particularly in the presence of heat and moisture, with the liberation of acids. As a surprise poisonous vapour its introduction was undoubtedly clever, since, owing to the absence of disagreeable smell or suffocating properties, several men at first were seriously poisoned before they were aware that any gas was about, and consequently before they thought of putting on their gas helmets. The surprise element, however, did not last long and now our troops are fully prepared, as far, at any rate, as helmets are concerned. I do not think, however, that it has yet been decided as to whether the skin effects are entirely the result of local action on the skin, or are in part due to excretion of inhaled gas or its products by the skin. Some of my own observations would lead one to think that the skin lesions are local ones, and if so it is probable that some defence in addition to the gas helmets will become necessary. Two of my reasons for regarding the action as local may be mentioned at once. The first is that in many cases the severity of skin and lung symptoms did not at all correspond: that is, one met with many severely burned cases who had few or no respiratory symptoms, and vice versâ. Secondly, in two or three of my cases the putting on of clothes which had not been specially treated, at an interval of some weeks after the initial exposure to gas, resulted in definite skin lesions.

The actual symptoms presented by patients as already stated are mainly cutaneous and respiratory, but certain other symptoms are also common. The entire group will now be considered seriatim.

Skin symptoms.—These vary from slight flushing of the skin to severe blistering, and the formation of burns extending as deep as the subcutaneous tissue. Any part of the body may be involved, but the moist and warm parts are mainly affected; thus the axillæ, scrotum, perineum and groins, are the most likely to suffer severely, though I have seen practically the entire body with the exception of the palms of the hands and soles of the feet, in a condition of almost continuous blistering. The appearance of skin lesions may be delayed a week or more after exposure to the gas. The colour of the initial blush is of a slightly mauve tint, which gradually deepens into a purple resembling that produced by the action of chrysarobin on a case of psoriasis on those parts of the skin that are free from psoriasis spots. Later, a dirty brown or bronze colour appears which very gradually fades. The burns heal slowly, and the deeper ones generally become septic, so that the condition of the patient from the skin lesions alone may be one of the most extreme discomfort. It is only right, however, to add that a great many cases present only mild and transient burning, which requires but little treatment and is in fact negligible.

Respiratory system.—With this system we may include the mouth, and at once state that an inflammatory reaction varying from mild catarrh to the most severe membranous inflammation with necrosis of the mucous membrane, may involve mouth, nose, pharynx, larynx and bronchial tubes. In the average case the nose and mouth do not suffer much, but in bad cases I have seen the nasal cavities choked up with membrane and pus, and have found a great deal of the interior of the mouth covered with whitish patches of necrosed mucosa. As a rule the throat is badly attacked, swelling and œdema of the uvula, membrane formation on uvula and soft palate and fibrinous pharyngitis are all common. Similar changes take place in the larynx, and as a result persistent aphonia is frequent. When, if ever, this aphonia disappears in severe cases, I am unable to state, as I have not so far been able to

trace the later history of cases. The bronchial changes, of which I hope to show some specimens later, cause much dysphonia and the expectoration of a quantity of thick yellowish muco-pus, containing fragments of necrosed mucous membrane. The pus is usually swimming with cocci of all sorts owing to secondary infection. In very bad cases the inflammation extends to the lung substance itself and produces a bi-lateral pneumonic consolidation, most often involving the lower lobes. If this occurs early the outlook is very bad, and but few cases recover. Pleurisy is a less frequent complication, but I met with several cases of dry pleurisy coming on often a fortnight after admission, and one case developed a pleural effusion within a couple of days of the gassing. This effusion I tapped, and found that the fluid had the same curious pinky mauve colour that I have referred to in describing the skin phenomena.

Eyes.—Irritation of the eyes is often the first symptom noticed by the patient. Conjunctivitis is practically invariably present, and frequently there is extreme lacrymation with swelling of the eyelids and complete closure of the eyes. Ulceration of the cornea is less frequent.

Blood.—The blood changes are interesting, and include the following :—(1) The rate of coagulability is much increased as compared with the normal. This is best marked in the worst cases, and therefore the coagulation time may be used as a guide to prognosis. In very bad cases coagulation may be almost instantaneous. (2) The R. B. C. are frequently increased in number per c.m.m., and the hæmoglobin estimation is high. This is probably due to stagnation of blood in the peripheral capillaries, and if so is, according to Cannon, a phenomenon met with in all cases of shock. (3) In thirty-five cases of which I have notes there was a mild leucocytosis and the lymphocytes (large and small) were in almost all cases increased out of proportion to the neutrophile cells. The average count in my cases was 15,000 per c.m.m. (4) In those cases showing severe skin symptoms an eosinophilia from 6-10 per cent. was observed. (5) At autopsies one was in-

variably struck by the curious glaring red colour of the blood. This colour suggested the presence of some special compound of Hb., but the few spectroscopic observations I was able to make did not confirm this. The Hb. was not broken down for the blood plasma and serum were usually quite colourless.

Other symptoms.—These may be considered briefly. They include :—(1) Great drowsiness and lethargy. Even mild cases showed these symptoms, which often persisted a week or more. (2) Persistent and excruciating headache, either frontal or universal. (3) Pains in the chest and abdomen. The latter pains were associated with severe nausea, but except in the worse cases, most patients were able to take ordinary diet without discomfort seven or eight days after poisoning. Constipation was the rule, but in a few cases diarrhœa of a dysenteric type was present and added much to the general misery, especially of those who had burning and ulceration of the buttocks. (4) Rise of temperature. This one would expect in any case of lung or skin inflammation, but over and above these cases I observed a special type in which, with practically no signs and only the symptoms of general malaise, the temperature remained continuously raised at a level of about 100° to 100.5° F. (5) Albuminuria was on the whole exceptional, but I encountered two fatal cases in which there was severe nephritis, and one other case of severe nephritis that recovered. Personally, whether rightly or wrongly, I formed the opinion that the extensive application of picric acid to the skin in these cases was bad, and was possibly responsible for the nephritis, as in each of the above mentioned cases almost the entire body had been painted with picric acid. Several other cases just as badly burned, but otherwise treated, did not develop albuminuria. (6) No special cardiac symptoms were present. The pulse, often slow in mild cases, became rapid and running in all that were severely poisoned. The blood pressure was invariably low and averaged only 80 m.m. Hg. in a large series of observations. (7) Convalescence even in mild cases was slow. Giddiness with return of

headache and nausea was frequently complained of when a patient was first got out of bed, and as a result large numbers of cases were evacuated to England owing to the difficulty of getting them well with sufficient rapidity in France. As a disabling agent undoubtedly mustard gas is efficient.

Treatment.—This should commence at the Field Ambulances, where every man who has been exposed to the gas should be stripped naked and douched with bicarbonate of sodium solution. Subsequently the patient should be sent down in fresh clothes. It is recommended that the orderlies who remove the clothes from patients should themselves be well covered up, and should wear double waterproof gloves, while as an extra precaution chloride of lime, which effectively neutralises mustard gas, should be sprinkled on the floor of all dug-outs into which patients are admitted.

The average patient arrives at a Base Hospital within 12-48 hours of being gassed, and there the routine that I personally adopted was the following. This routine obviously entailed much trouble on the Nursing Staff, but appeared well justified by the results. First, the bathing of the body with bicarbonate of sodium solution was repeated, and either an alkaline cream or an alkaline powder was applied to the face, axillæ, and bathing drawers region. The eyes and nose were then douched with 2½ per cent. bicarbonate solution, and this was continued once or twice daily till all symptoms had subsided. A bicarbonate mouth wash and gargle was also ordered, and in addition a simple steam inhalation was given. This latter usually effected the greatest possible relief to the sensation of burning in the throat and to the laryngeal cough. Internally no drugs were given as a routine, but if gastric symptoms were troublesome either saccharate of calcium solution—one in a thousand—ʒi daily—or again, bicarbonate of sodium was administered. In very bad cases symptoms were treated as they arose, intravenous injections of saline with 3 per cent. sodium bicarbonate being occasionally employed, and when the

heart began to flag stimulants of all sorts, of which camphor in olive oil given subcutaneously appeared to me to be best. Out of 189 cases during my stay at the hospital there were only five fatalities, a result showing that however disabling the gas may be, it is less fatal than many of the other poisons employed by the Boche.

ART. II.—*Notes on the Pathological Changes occurring as a Result of Poisoning by Mustard Gas.*[a] By WM. BOXWELL, M.D., F.R.C.P.I.; Physician to the Meath Hospital and County Dublin Infirmary; Professor of Pathology in the Schools of Surgery of the Royal College of Surgeons in Ireland.

AT the time we left France, early in August of the year 1917, the exact nature of this gas was not known, nor is it yet understood to what elements in its composition or decomposition the toxic effects are due. These notes, moreover, are necessarily very imperfect, based as they are upon a very limited experience—some nine or ten cases of varying severity—which ultimately came to the *post mortem* room.

The first case observed was apparently burned from head to foot. The lesions were superficial, but there was widespread peeling of the epidermis with a great deal of dusky discoloration. For a moment it was thought that this man must have been the victim of a German "Flammen-werfer," but then it was noticed that although he was badly burned about the groins, scrotum, and axillæ, the hair was not singed. Moreover he was a member of the Garrison Artillery, and would not naturally have come within range of this weapon. The burns must therefore have been due to some violent chemical action.

There was nothing very remarkable in the other *post mortem* findings, beyond a general congestion of the

[a] Read before the Section of Medicine in the Royal Academy of Medicine in Ireland on Friday, January 18th, 1918.

organs, and it was assumed that death was due to shock following extensive superficial burns.

This burning of the skin proved to be a characteristic feature of these cases. It was accompanied by a dusky brown or purple discoloration, and was most obvious about the axillæ, groins, scrotum and inner aspects of the thighs, situations where perspiration was most active, and where there was the greatest amount of moisture upon the surface. If a man was accidentally wet in other parts there the gas took effect, whereas little harm was done by exposure when the skin was dry. The eyes were invariably involved in some measure of conjunctivitis.

In subsequent cases there was no doubt that death was due to a violent inflammation of the respiratory tract. The lungs when removed were voluminous, preserving their contour like the lungs in lobar pneumonia. There was scarcely any fluid in the pleural cavities, though the greater part of the lung-bases was covered by a thin film of fibrinous pleuritis. Small sub-pleural hæmorrhages were not uncommon. The lungs when cut into showed extreme congestion. The cut surface was a dark crimson, or plum-colour, rather dry and, except at the extreme apices, gave little or no crepitation. Sometimes small pieces cut out sank in water, but as a rule the apparently pneumonic lung floated. The cut lung had the colour of extreme passive congestion, but had none of the "soapy-sponge" feel usual in that condition. When the lung was squeezed, points of pus appeared here and there, mixed with blood, but only in the apices was there any trace of the frothy effervescence characteristic of acute œdema. The most striking feature of these specimens was the condition of the pharynx, larynx, trachea, and bronchi. These tracts in the severe cases were deeply injected and more or less covered by a thick yellowish-grey membrane. When fresh this membrane, with its sharply defined and fretted outline, stood out in strong relief against the deep crimson of the already denuded, or less affected areas. It extended down the bronchial tubes as far as they could be opened up with a pair of scissors, while in some cases

the vocal cords had disappeared through necrosis and subsequent ulceration. In many places the membrane had flaked off, and was found lying free, or partially plugging the bronchi lower down.

A curious feature noted in two of the cases was a local "bullous" emphysema of the extreme apices. The pleura was blown up into a collection of vesicles, clustering together like a large mulberry. A somewhat similar local emphysema, forming irregular holes, or rents, in the net-work of the lung tissue, and filled with sero-fibrinous exudate, can be seen in nearly all the microscopic sections made from different parts of the lung. Sections show that the condition is a mixed pneumonia, hæmorrhagic in every instance, in many necrotic. In the earlier or milder cases there is intense engorgement of the capillaries, with wholesale desquamation of the vesicular endothelium. There is a certain amount of catarrhal exudate, local emphysema, and hæmorrhage. The bronchioles show a desquamated epithelium, or none at all, and are generally plugged with leucocytes. They may be surrounded by areas of lobular consolidation. Thus far it is a hæmorrhagic bronchopneumonia. Later on the pneumonia process spreads; the vesicles become choked with leucocytes and red blood cells. Large patches or even whole lobes become frankly hepatised, and the lung tissue undergoes necrosis. The necrosis is irregular in distribution, and does not necessarily correspond with hæmorrhage.

In the heart and pericardium surprisingly little change was noted. Petechial sub-epicardial hæmorrhages were often seen, but there was no fluid to speak of in the sac. Though the cavities were partly filled with dark clot the muscle was quite firm, and there was a marked absence of dilatation of the chambers.

In the spleen necrosis and hæmorrhage were obvious in one case. The kidneys showed some cloudy swelling and congestion, but there was nothing very striking to be seen here. In the stomachs of two of the cases there was hæmorrhagic gastritis, and in one case minute ulcers

formed at the cardiac end. There was nothing specially noteworthy in the liver or other organs examined.

It is interesting to contrast these changes with those occurring in the earlier cases of gas poisoning by chlorine. There acute pulmonary œdema and effervescence of a canary-yellow froth, with death from asphyxia, were the dominating features. Here necrotic inflammation and a toxin acting not only directly, but indirectly, through the blood seem to be characteristic.

ART. III.—*Beard's Theory of the Alternation of Generations and the Abderhalden Pregnancy Reactions—A Criticism.*[a] By W. M. CROFTON, M.D.

IF a foreign protein makes its way unchanged into the circulation through the intestinal wall, or is introduced intravenously or subcutaneously by means of a syringe, a specific ferment for it is formed which will enable the tissues to digest, that is, to hydrolyse the protein so that it can be used as food. The same thing occurs if cane sugar or a foreign fatty acid is introduced. Similar ferments are present in the blood for the ordinary food materials which are sent in a uniform pattern into the circulation after passing through the mill of the intestinal cells. If the foreign protein contains ferments, for instance, the intracellular toxins of microbes, anti-toxins, that is, anti-ferments, are also formed, but these do not concern us here.

In order that these specific ferments should be formed the substance must be "foreign," or as Abderhalden calls them "disharmonious." The blood corpuscles of man will not induce in man anti-bodies (haemolysins) for the blood corpuscles of man but the corpuscles of a sheep introduced into man will produce a ferment or haemolysin for themselves if introduced parenterally into man. These tissue ferments are compound ferments consisting of two parts; one part, which is not destroyed by heating to

[a] Read before the Section of Obstetrics in the Royal Academy of Medicine in Ireland on Friday, November 22, 1918.

60° C., that is "heat stable," is absolutely specific for the given antigen, it is known as "co-ferment," or in immunology as "immune-body"; the other part is not specific, or at best feebly so, is destroyed on heating to 60° C., that is "heat labile"; it is called ferment or in immunity "complement." The co-ferment must be attached to the antigen before the ferment can be attached and the hydrolysis take place; this is sometimes spoken of as the "sensitising" of the antigen.

There are various ways of testing for the presence of this co-ferment or immune body. Abderhalden looks for the break down products and tests for them either by the biuret or other test, or by the alteration of a specific rotation of polarised light. The great disadvantage of these methods is that in the case of the higher proteins they must first be treated to destroy any intracellular ferments that might be present, otherwise they would undergo hydrolysis by auto-digestion.

A much better test is the fixation of the co-ferment to the antigen which leads to the fixation of the ferment. These fixations can easily be tested for by the addition of sensitised blood corpuscles, that is, red blood corpuscles with their specific co-ferment or immune body attached.

As I have said, in order that specific co-ferments should be made the protein must be foreign, must belong to a different natural order, otherwise the tissue infected undergoes the ordinary tissue digestion. Even if, for instance, spermatozoa are injected subcutaneously or intravenously into a woman no specific co-ferment is formed.

How then is it possible for Abderhalden to state that specific co-ferment for the placenta is formed in the pregnant woman since the placenta consists of homologous cells to those of the mother, and it is boiled placenta that Abderhalden uses as his substrate or antigen. The Abderhalden test for pregnancy, I think I may safely say, has been found non-specific, for the plasma or serum of the male has often been found to bring about hydrolysis. And

yet Abderhalden was very nearly right for it is highly probable that co-ferment for the cells of the chorionic villi is formed, the hypothesis being, that if it is not formed a chorion epithelioma is likely to result.

How is it then, presuming this is true, that the cells of the chorionic villi can bring about the appearance of antibodies and that placental cells, with one possible exception—the syncytial layer—cannot? They must obviously belong to a different order to the cells of the maternal body.

This is not possible if we accept the usual theory of the direct development of mammals, the new individual arising directly from the fertilised egg. If, however, we accept Beard's theory of the alternation of generations in vertebrates then there is a reasonable explanation, for the cells of the chorionic villi belong to the phorozoon, or asexual generation, and are, therefore, foreign or disharmonious to the cells of the mother, so that these must produce special ferments to deal with them and special anti-ferments to neutralise their intra-cellular ferments.

According to Beard, then, the egg when fertilised divides and subdivides to form a larva, from a certain cell of which the fœtus arises by an asexual process. Certain other cells form germ cells which make their way into the fœtus when it is formed, and arrive at the genital ridges, and afterwards develop into the ova and spermatozoa.

The mass of the placenta consists of fœtal and maternal tissue, and is therefore incapable of inducing co-ferment in the mother. The only tissue of it which is derived from the larva, and is therefore foreign, is the layer of syncytium, which must in any given amount of placental material used in the test be insufficient to produce the desired result.

Beard first got on to the track of his discovery by observing the appearance of a transient nervous system in the early development of the skate; this is the nervous system of the larva. According to Beard the cells of one generation can live at the expense of the other—that is, their ferments can hydrolyse the protein of the other. As

the fœtus grows the chorionic villi, &c., disappear, being used up in the development of the fœtus. There can be no doubt the cells of the chorionic villi do burrow into—that is, do nourish themselves at the expense of—the tissues of the uterus.

Beard's theory of cancer is that it is a phorozoon or larva, an asexual generation differing from the normal larva in that no spore cell arises to form a fœtus. To me this is quite the most attractive theory of cancer at present before us. Unfortunately, Beard's theory of cancer has come into discredit owing to his insistence that cancer could be cured by injection of trypsin and amylopsin, the injection of which into the circulation is followed by the development of anti-trypsin and anti-amylopsin, so that their digestive effect, if any, on the cancer cells would be neutralised. In this Beard, like Abderhalden in the other case, was nearly right; he should not have used the co-ferments of the pancreas, but the endo-ferments or internal secretions for this purpose. I have several reasons which cannot be gone into here, for thinking that the cell-islands of Langerhans are at any rate one of the chief sites for the production of co-ferments for foreign antigens as they are for those for the normal tissue digestion of carbohydrates, fats and proteins.

Beard's theory quite apart from this demonstration of the transient nervous system in this skate always appears to me very reasonable, for why should the vertebrates differ in their method of development from nearly every other order of multi-cellular animal and vegetable. After all the sexual generation in the higher plants, reduced as it is to a few cells, is much more insignificant than the asexual generation in the vertebrates, which consists of a considerable mass of cells.

To sum up, Abderhalden's test may be diagnostic of the early stages of pregnancy if—

(1) Chorionic cells are used as substrate.

(2) Fixation of complement be used as the test for the presence of co-ferment.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES

AIDS TO THE STUDY OF CLINICAL MEDICINE.

1. *Aids to Medical Diagnosis.* By ARTHUR WHITING, M.D., Physician to the Prince of Wales's General Hospital, Tottenham, London, N.; Consulting Physician, County of London War Hospital; Lecturer in, and Dean of, the North-East London Post-Graduate College. Second Edition. London: Baillière, Tindall & Cox. 1918. F'cap. 8vo. Pp. viii + 167.

2. *Clinical Case-Taking: An Introduction to Elementary Clinical Medicine.* By ROBERT D. KEITH, M.A., M.D. (Aberd.); formerly Principal of the King Edward VII. Medical School, Singapore; Consulting Physician, Tan Tock Seng's Hospital, Singapore; Lecturer in Clinical Medicine in the King Edward VII. Medical School, &c. London: H. K. Lewis & Co., Ltd. 1918. Cr. 8vo. Pp. 104.

WE have grouped these two small books together under one heading because they are complementary one to the other.

1. DR. WHITING'S "Aids to Medical Diagnosis" was first published towards the close of the year 1906. It was intended for those who already possessed a knowledge of systematic Medicine, whether advanced medical students or post-graduates. In his preface to that edition, Dr. Whiting expresses his indebtedness to Dr. Herbert Cuff, for many years in charge of one of the larger fever hospitals under the London Metropolitan Asylums Board, for undertaking to write one of the most important sections—that on the differential diagnosis of infectious diseases. In the

present—the second—edition, Dr. Whiting tells us that the section in question, and that alone, stands verbatim as in the earlier edition. It is a matter for regret that this section, constituting Chapter II., has not been revised.

While the information on this important branch is in the main accurate, it is somewhat sketchy in character, and the whole subject is disposed of in 18 pages. In the case of scarlatina, no allusion is made to the singular rapidity of the pulse in the early stages of the disease or to the "tache scarlatinale" as diagnostics. Also the petechial stain of the fading rash is by no means confined to the inner side of the thighs: it is well marked also about the flexures of the joints elsewhere. In the diagnosis of measles, the intense redness of the eyelids is quite as important a diagnostic as the so-called Koplik's spots, to which pathognomonic value is justly attached, although we would prefer to describe these spots simply as a measles rash on the mucous membranes of the mouth. Dr. Cuff does not mention the very characteristic behaviour of the temperature in the invasion and eruptive stages of measles. In the subsection on diphtheria, a "croupy cough" is spoken of, and the phrase "spurious croup" is used to describe laryngeal spasm. May we ask Dr. Cuff whether he believes in "croup"? If he does not, surely he should give up using the terms "croupy" and "spurious croup." Enteric fever is disposed of in less than two pages. Rose-spots are only incidentally referred to in the differential diagnosis of this infection from influenza and from typhus, and there is no mention of splenic enlargement. The "rash" of typhus is really a purpuric manifestation rather than a dermatitis. For a diagnosis of small-pox Dr. Cuff seems to rely solely on the skin eruption—no mention is made of the backache of invasion, the gastro-intestinal symptoms, and the tendency to hæmorrhages.

Dr. Whiting states that the main alterations and additions in this second edition are in the section on Diseases of the Heart. This section constitutes Chapter V., and runs to 26 pages. It now includes a description of the

irregularities in rhythm (arrhythmias) of the pulse and the reasoning that leads to their elucidation. This is taken almost entirely from an article on "Recent Advances in our Knowledge of Heart Disease," contributed by the author to the *Lancet*, of July 20, 1912. This section is well illustrated by tracings of the normal and abnormal jugular pulse and of the radial pulse. The phrase "the mitral first sound" (page 65) puzzled us somewhat at first, but we suppose Dr. Whiting means the first sound as heard in the mitral area, or at the site of the apex beat. Another curious phrase is "an apical presystolic thrill, purring in character." This is mixing up palpation and auscultation. Why does the author spell aneurysm with an "i"? It is a classical Greek word.

2. Dr. Keith's admirable guide to Clinical Case-taking was originally written for the students of the King Edward VII. Medical School, Singapore. The first draft had just been completed when the author was obliged to return to Europe. He subsequently was seriously ill, and it has been only lately that, during convalescence, he has been able to devote his attention to it again. As he is not returning to the East, he has given effect to a suggestion that what he modestly calls "the booklet" might be made available to a wider circle of students than that for which it was intended in the first instance.

It is one of the best and most concise guides to clinical case-taking that we have come across. It cannot fail to be of use to medical students, among whom we doubt not that it will become widely known and justly popular.

Gynæcology. By William P. Graves, M.D., Professor of Gynæcology at Harvard Medical School. Second Edition. With 491 Illustrations, 100 of them in Colours. Philadelphia and London: W. B. Saunders Company. 1918. 8vo. Pp. 885.

In reviewing this second edition of Graves' Gynæcology we congratulate the author on an improved text-book. There are three special points which must be criticised

adversely. The first is, that there is no description of the treatment of recto-vaginal fistula; this is a most unpleasant and difficult condition to encounter, and should not be omitted in a tome of this kind. The second is that, while excellent details are given of the operations for prolapse of the uterus, the general discussion on the subject is not conclusive. The third point is the treatment of displacements of the uterus generally. Why are gynæcologists unable to agree on the definitions of version and flexion? Perhaps when a League of Nations is an accomplished fact a League of Gynæcologists will have been established, and it will be unnecessary for students to memorise different definitions of displacements for their respective teachers.

There are 885 pages in the book, of which 176 are included in Part I., on the physiology and relationship of gynæcology to the general organism. This is a most important part, and deals specially well with the relationship of gynæcology to the glands of internal secretion. Since it has become so popular, we have read many papers on this subject, but despite them all we are still in the dark. As Dr. Graves says: "The theory of a correlation between the glands which constitute the endocrine system, though only vaguely understood, is, nevertheless, essentially well established."

Part II. deals with gynæcological diseases, and this is the largest part of the book. The author is a pronounced follower of Hitschmann and Adler with regard to chronic endometritis. He classifies it as follows:—(1) Infectious endometritis, the result of microbic invasion; (2) chronic interstitial endometritis, resulting from a previous infectious attack; (3) gland hypertrophy, resulting from circulatory changes. This question, like displacements, must be settled.

The whole subject of uterine fibroids is explained, and while the author preserves an open mind, his choice is evidently supravaginal hysterectomy, a view which will be shared by many, in spite of a paper on the benefits of radio-therapy by Howard Kelly in the September number

of *Surgery, Gynæcology and Obstetrics.* The Wertheim operation is recommended for cancer of the cervix, and the radium treatment is given in detail.

Pessaries are not advised for backward displacements. Would that pessaries were abolished altogether! The pessary treatment of acute anteflexion is described, but it is not recommended. It is a pity that this dangerous and out-of-date procedure was mentioned.

In Part III. gynæcological operations are excellently and beautifully illustrated. Dr. Graves has a great advantage over the ordinary author in his skill as an artist. With the exception of the microphotographs, all the splendid illustrations have been executed by him.

We have no hesitation in recommending this work to all practitioners, most particularly to the gynæcological specialist. B. S.

An International System of Ophthalmic Practice. Edited by Walter J. Pyle, of Philadelphia. *Medical Ophthalmology.* By Arnold Knapp, M.D. London: William Heinemann. 1918. Large 8vo. Pp. xv. + 509.

This book—Medical Ophthalmology—is one of a series forming an International System of Ophthalmic Practice. There can be no doubt that the work will prove very useful to ophthalmic surgeons as well as to general physicians.

Beginning with a thoroughly well-written account (in which Marburg, of Vienna, helped) of the anatomy and physiology of the visual parts, the pupillary reactions, the ocular nerves, &c., &c., the author takes his readers seriatim through the eye diseases or symptoms associated with diseases of the nervous system, of the internal secretions, of the circulation, of the respiratory tracts, of the digestive tract, and so on. The descriptions are divided into sections, and each section constitutes a very readable account of the conditions which it pictures. The style is easy, and the whole book is pleasant to read. It is no small boon to have thus concentrated into one readable, handy volume

all the eye symptoms which may be expected to be met with in the course of diseases so widely apart as the exanthemata and clinical poisons. Dr. Knapp has done his work very well, and the book is worthy of its inclusion in the International System of Ophthalmic Practice.

The Twin Ideals: an Educated Commonwealth. By JAMES W. BARRETT, K.B.E., C.B. C.M.G., M.D., M.S., F.R.C.S. (Eng.); Temporary Lieut.-Colonel R.A.M.C.; lately Lieut.-Col. A.A.M.C. and A.D.M.S. Australian Force in Egypt; Consulting Oculist to the Force in Egypt and Registrar, First Australian General Hospital; Ophthalmologist to the Melbourne Hospital, Member of Council of Management and Lecturer on the Physiology of the Special Senses in the University of Melbourne; Consulting Aurist, E.E.F., 1916-17; President, Invaliding and Classification Boards, Cairo and District, 1917; Member Council British Red Cross, Egypt, and also Y.M.C.A., Egypt. (Published by kind permission of the General Officer Commanding in Egypt, 1916-17, General Sir Archibald Murray.) With Maps and Diagrams. Two Volumes. London: H. K. Lewis & Co., Ltd. 1918. Demy 8vo. Vol. I. Pp. xxxii + 512. Vol. II. Pp. xx. + 504.

THE many-sided interestedness of the author are at once suggested by a glance at his title-page. And the magnitude of his mental outlook is proportionately reflected by his physical activity. Without such a combination the record represented by the present collection of essays, memoranda, articles and letters could never have been produced: they discuss every view—or nearly—of the principal aspects and conditions of the education and government of the present, somewhat imperfect, and future ideal, Commonwealth. And the immortal Stagirite himself hardly approached the subject with greater earnestness, or the famous Florentine Secretary with a more vivid sense of the defects of the fundamental strata on which the colossal structure of a great commonwealth is necessarily founded.

As an experienced medical man, as well as politician, the author thoroughly estimates the supreme valuation —in each department—of prevention, in comparison with the usual futility of attempts to cure. He quotes with keen appreciation the view of Huxley regarding the coming of "the sweet girl graduate," and refers—with a pang we noticed the fact—to "the erection of the Atbara Bridge, which Lord Kitchener entrusted to an American firm because no English firm could do the work with the same facility, and the complete construction and equipment of the new underground electric railway in London by Americans."

He tells us that: "Prostitution is frequently referred to by writers as being due to poverty, but in Australia, where there is practically no poverty, and where female labour commands a high remuneration, prostitution exists in much the same amount and kind that it does in other countries, and it exists for two amongst other reasons. A certain number of demoralised women wish to obtain a living without working for it, and a certain number of unmarried men form associations with them."

The contents of these volumes are well worthy of the serious attention of all readers, for they suggest or recall some aspects of most of the perplexing series of problems now before the sorely-tried and bewildered mass of humanity. But behind, above, and—we fear—around all is the atmosphere created by the demon of "frenzied finance," to the throne of which civilised man seems to have allowed himself to be bound, a quite willing, but still curiously unconscious, captive. We were somewhat startled a short time ago by hearing somebody—*not* a practising politician—declare roundly that our present world-war is wholly due to the stage-management of a great financial firm, which skilfully engineered the Archducal murders as the explosive pretext, and thereupon *ordered* its Austrian vassal to proceed accordingly; just as it engineered the Boer War by the newspaper inspiration so skilfully and continuously provided by its South African

branch—while the whole democratic movement of the past century emanated from the same source, simply because democracy offers a far more fertile field for the culture of financial thimble-rig than despotism ever can. The latter fact also furnishes the key to the result of Waterloo, which had to be provided for by arrangement with Grouchy, *personally* conducted on account of the enormous importance of the stake, after having exhausted the profiteering of England which its representative came over to conquer —like a second William of Normandy—just at the crucial pre-revolutionary date! Such an improvised master-key for all the locks of the secret cabinets of contemporary civilisation is not, of course, of the form likely to be accepted for journalistic evangelisation, or the general enlightenment of our progressive world-democracy of liberty (!), equality (of voting capacity) and fraternity (of the remotely future international brand). But, in the meantime, the very comprehensive contents of the work now before us may furnish many useful hints for short-range action. K.

Diseases of Children. By GEORGE M. TUTTLE, M.D., and PHELPS G. HURFORD, M.D. Third Edition, thoroughly revised and enlarged. Philadelphia and New York: Lea & Febiger. 1917. Demy 8vo. Pp. vi + 599.

THE appearance of a third edition to this work shows that its value as a small handbook for the student and general practitioner is being recognised. While it cannot in any sense claim to be a complete text-book, it will prove invaluable to many wishing for a brief, concise account of the serious ailments of children.

The third edition is practically a new book, most of the sections having been rewritten and brought up-to-date.

The section on the nutritional disorders of infancy is particularly good, giving, as it does, a short, clear classification of the various conditions, and bringing order into a subject which in many minds and even in some text-books

is rather chaotic. There is also a clear account of the percentage and the caloric methods of feeding.

The section on anterior poliomyelitis contains the results of the investigations during the New York epidemic of 1916, and as such is rather disappointing. Much, however, has of necessity been sacrificed to conciseness, and the chief points are noted, if not elaborated. The value of the book is enhanced by a good index and excellent illustrations.

Local and Regional Anæsthesia. With Chapters on Spinal, Epidural, Paravertebral and Parasacral Anæsthesia, and on other Applications of Local and Regional Anæsthesia to the Surgery of the Eye, Ear, Nose and Throat, and to Dental Practice. By CARROLL W. ALLEN, M.D.; Assistant Professor of Surgery of the Tulane University of Louisiana, New Orleans, &c., &c. With an Introduction by RUDOLPH MATAS, M.D. Second edition, reset. Philadelphia and London: W. B. Saunders Company. 1918. Royal 8vo. Pp. 674.

THIS large monograph of almost 700 royal octavo pages, deals, as its title shows, very fully with the different local anæsthesia and the methods of administration. The author is an enthusiastic advocate for the use of local anæsthesia, and has shown his preference for this form of production of analgesia by using it in 60 per cent. of his surgical operations. By this method he believes he has greatly reduced the mortality of the ablation of the prostate in the aged, and the addition of sacral anæsthesia has been in his practice a decided change for the better from general anæsthesia. A good deal of space is devoted to showing the many risks of spinal anæsthesia, and none of its risks are left untold. Withal, we are not convinced that it can with advantage be displaced by the local treatment. But probably the most interesting section of the book is that given to the study of the anæsthetisation of the head, scalp, cranium and face. For the injection of an anæsthetic

into the foramen rotundum or into the foramen ovale, or the transfixing of the Gasserian ganglion by the Hartel method would, we think, be beyond the skill of any ordinary operator; and for operations such as these we would still prefer to use general anæsthetics. The bias towards local anæsthetics has influenced the judgment of the author to a considerable extent, yet in spite of this he has produced a very valuable monograph, one well worthy of study, profusely illustrated, and rich in detail.

As we read the volume we were from time to time impressed with the wonderful outcome of Alexander Wood's analgesic hypodermic injection of morphine, in 1834, in the Edinburgh Infirmary, and how narrowly Francis Rynd, of the Meath Hospital, working independently of Wood, missed the honour.

War Wounds of the Lung. Notes on their Surgical Treatment at the Front. By Pierre Duval. With 27 Plates and Illustrations. Authorised English Translation. Bristol: John Wright & Sons, Ltd. 1918. viii + 99.

One of the most interesting and instructive books which has been published as the result of the experience gained at "the Front" is that which lies before us.

The war has brought about many changes in surgical technique as well as in our ideas as to the treatment of war wounds, but it is not too much to say that it has revolutionised our ideas of the surgery of the lung. The little manual consists of eight chapters and an appendix.

Chapter I. shows the mortality of chest wounds. The mortality at the regimental aid posts is about 25 to 30 per cent. Hæmorrhage and mechanical asphyxia (open thorax with traumatopnœa) are the two chief causes of death. At the same time it must not be forgotten that a number died upon the field from wounds of the thoracic vessels, and these cases do not appear in any statistics.

The mortality, of course, is heavier the further the cases

are treated from the fighting line. Half the fatal cases die early.

The mortality from bullet wounds is low compared with that from shell wounds. Wounds with an open thorax are at least twice as dangerous as those with a closed thorax.

Chest wounds are among the most fatal of battle injuries, and demand the most vigorous efforts to improve their treatment.

Chapter II. is devoted to a consideration of the anatomy of lung wounds.

Shell wounds are the typical examples to be considered. Splinters of bone driven into the lung contribute to the destruction of the parenchyma, while, of course, pieces of clothing are not infrequently carried into the lung as well as into other parts by the fragments of the shell.

The sum of these facts proves that chest wounds possess all the characters of every other shell wound—tissue destruction and haemorrhagic infiltration of varying degrees; the presence of all sorts of foreign bodies, projectiles and *débris*.

The anatomical injuries, the infecting foreign bodies, the bacteriological findings, and the biological changes are all the same.

"It is of the utmost importance to grasp the fact that not only does the actual wound affect the lobe traversed, but the other lobes of the same lung may sustain partial injury, and the opposite lung may, by contre-coup, be more or less seriously injured.

"It has been shown by *post-mortem* examination in cases of patients dying from other injuries who had been wounded through the lung that shell wounds of the lung can heal as readily and completely as do bullet wounds."

The surgical treatment of all other wounds is governed by their pathological anatomy. Why should not the same principles be applied to wounds of the lung? This is the aim with which the author worked, and the results of operative treatment have proved the correctness of his views.

Hæmorrhage from the lung is treated by direct operative interference, just as in other regions. The author's first statistical table for operative arrest of pulmonary bleeding showed nine recoveries out of fourteen cases.

It has been shown that thoracotomy, unlike laparotomy, has practically no effect on the arterial blood-pressure. Operation can be performed even with a minimal blood-pressure of 50 when laparotomy would not be tolerated.

"The patient's general condition never offers a contra-indication to thoracotomy."

The author by his own work has established the important fact that in 17 operations performed for the arrest of severe pulmonary hæmorrhage, 70.6 per cent. of his cases recovered. He gives a list of the work of some other surgeons, which shows 67.7 per cent. of recoveries.

Chapter IV. is devoted to a consideration of the infection of lung wounds.

Small shell wounds and bullet wounds are frequently sterile. "Large shell fragments are always infected." "The lung wound is almost always the seat of a severe anaerobic infection, particularly if fragments of bone have been blown into the lung or pleural cavity."

The infection may develop in one of three places :—

1. The hæmothorax—the commonest.
2. The wounded lung.
3. The lung and pleura of the opposite side.

Septic broncho-pneumonia and pneumonia are uncommon.

The author is convinced that early and marked hæmolysis is one of the most reliable macroscopic signs of infection of the hæmothorax.

At a glance one realises that lung wounds are first contaminated and then infected by the same organisms as all other battle wounds.

Anaerobes seem to grow badly in lung tissue. The lung is peculiarly resistant to them.

The gravity of chest wounds from the fifth day onwards is due to pleural suppuration much more than to infection of the lung itself.

There is no reason to regard a lung wound as being different in any way from other wounds.

The anatomical lesions are characterised by just the same destruction, the same necrosis of tissue, and the same hæmorrhagic infiltration.

"The lung, like wounded muscle, presents a mass of dead tissue, destined to undergo proteolysis, which is a perfect culture medium for infective bacteria, and the consequences are the same."

Gas gangrene of the lung itself, if not altogether absent, is very seldom seen.

Pleural or pleuro-pulmonary infection is the most terrible complication of a wound of the lung.

The first principle in war surgery is to prevent infection of wounds, and the only method of preventing sepsis in gunshot wounds is to operate upon them early, to remove all foreign bodies, and to excise as far as possible all neurotic tissue. This is the principle which is now being applied, and with great success, to wounds of the lung.

Bullet wounds may be regarded as relatively benign: but injuries from shell-fire are amongst the most fatal of war wounds.

The treatment of lung wounds is considered under three heads:

1. The penetrating wound, with the missile retained.
2. An entirely superficial wound.
3. The perforating through and through wound.

For No. 1, the best treatment is to extract the foreign body through its entrance track. The track is then cleaned out by a mounted gauze wick or gentle mopping, followed by suture of the opening into the lung, so as to guard against pleural infection from the lung.

The author states that the treatment of a through and through wound (No. 2) by mopping out the whole length of the track to remove foreign bodies and neurotic tissue has never been employed by him, but he says it might be worth a trial. With a large surface wound of the lung excision may be practised, followed by complete suture

From the 36th hour onward the focus of pulmonary congestion is formed round the F. B. or the wound in the lung.

Operation at this period would be undertaken on already infected tissue. The results would be uncertain, if not frankly bad.

Large fragments of foreign bodies must always be removed; minute fragments may be left without particular danger.

Chapter VI. is devoted to "The Urgent Surgery of Open Thorax"—a term coined during the war to describe a class of chest wound in which the thorax is widely opened, and air passes directly into the pleural cavity with each respiratory movement.

Urgent surgical intervention is called for to close the thorax. This is necessary for two reasons: (1) to lessen the danger of asphyxia, which is threatened by an open thorax; and (2) to protect the pleura against infection from without.

In Chapter VII. the operative technique is fully described.

Anæsthesia by inhalation must be regarded in war surgery of the lung as a factor of considerable risk. If a general anæsthetic is to be employed it should not be ether.

Drainage of the pleura is not practised. It is positively harmful. An incision about the level of the fifth rib gives the best and easiest access to the whole extent of the lung. This incision extends from the mid-axillary to the parasternal line.

After opening the thorax, deal first with the lung, and perform the toilette of the pleura subsequently.

Hæmorrhage is best treated by suture or ligature. Plugging is to be avoided if possible, as it is only a makeshift.

The subject is one of such interest and the treatment so revolutionary that we have made a short epitome of the book rather than review the book in the usual way.

It is a subject which must interest the physician just as much as the surgeon.

Glaucoma. A Text-book for the Student of Ophthalmology. By Lieut.-Colonel R. H. Elliot, M.D., &c. 158 Illustrations, including 19 Plates, 1 Coloured. London: H. K. Lewis & Co., Ltd. 1917. 8vo. Pp. xvi + 546.

Every ophthalmic surgeon should possess a copy of this book, the result of three years' work by Colonel Elliot, as he tells us himself. Having sifted, composed, thought over, and discussed (notably with Mr. Treacher Collins) the disease called glaucoma, he gives us the fruit of his labours, and we owe him a great debt of gratitude. For, at all events, he has produced an orderly, considered account of a disease concerning which probably no two ophthalmic surgeons would quite see eye to eye. Not that all of us will quite see eye to eye with Colonel Elliot in every little detail. To mention one: "Very few cases, if any, of glaucoma are absolutely innocent of a congestive element throughout their course." Still the amount of labour expended has been great, and the results correspond. For in this book we have what will prove to be "the last word" on glaucoma for many a long day to come.

We do not attempt in a journal of this kind to give a minute review—that is better fitted for the more technical journals—but we can most heartily congratulate and thank Colonel Elliot for having given us such a valuable book.

Eleventh Annual Report of the Massachusetts Hospitals for Consumptives. November 30, 1917. Commonwealth of Massachusetts, Public Document, No. 77. Boston: Wright & Potter. 1918. Pp. 92.

This Report concerns four institutions under the control of the Board of Trustees of Massachusetts Hospitals for Consumption—the North Reading, Lakeville, Westfield, and Rutland State Sanatoriums. These provide beds for nearly 1,100 patients. By a recent enactment of the Massachusetts State Legislature provision has been made

for the care of advanced cases of consumption, and these four institutions in future will be reserved more strictly for early and favourable cases. The State of Massachusetts appears to have a very complete system for dealing with the tuberculous amongst its population under its new Act. The statistical tables, which are a feature of this Report, have this year been shortened somewhat, and we miss the details formerly given regarding the nationalities of the patients and their parents.

Thoroughness and attention to detail characterise the work of each institution. As an example of this thoroughness we would quote the summary as given in the Report of the findings of Miss Billings, the after-care worker, and of the secretary of the Board, in their investigations as to the results of treatment in Massachusetts in terms of health and also in terms of dollars and cents.

It was found that over 300, or approximately 33 per cent., of the total number of patients, or nearly 50 per cent. of the total number that Miss Billings visited, were alive, and apparently well and working. Some of these had left the sanatoriums less than a year, but, on the other hand, many had left the sanatoriums four or five years ago. These figures, considering the fact that there were over 75 per cent. of advanced cases in this series, showing nearly 50 per cent. of those who were improved by their stay in the sanatoriums, were able to be considered as wage-earners, are certainly encouraging.

In terms of dollars and cents, a conservative estimate based on what these patients who are now alive and well are earning—which, by the way, does not include the potential earning powers of many women and children—showed weekly earnings of 3,000 dollars. The amount that these patients are earning per week will go a long way towards offsetting the amount that the State has spent on the total number, and shows conclusively that the investment that the State of Massachusetts is making in sanatoriums is a good one, both financially and in terms of health.

Medical Diagnosis for the Student and Practitioner. By Charles Lyman Greene, M.D., Professor of Medicine; Chief of the Department of Medicine and Chief of Medical Clinic in the University Hospital, St. Paul's, Minnesota, U.S.A. Fourth Edition. With 14 Coloured Plates and 548 other Illustrations. London: William Heinemann. No Date. Pp. xix + 1302.

From being a convenient pocket manual, Dr. Greene's Medical Diagnosis has grown to a thick octavo volume of over 1,300 pages, weighing 5 lbs. 8 ozs., very difficult to handle. This might have been avoided by issuing the work in two volumes. We mention this now in the hope that the succeeding editions may be issued in a two-volume form, for the book well repays reading. Nothing more helpful for a student, qualified or unqualified, has come under our notice than the article, "The Outward Signs of Disease." We read it with benefit and pleasure in spite of the heavy, clumsy, deterrent volume which contained it.

Intrathoracic Radiography is a valuable article, but the skiagraphic illustrations of the letterpress are wanting in clearness: blurred pictures are worthless. The bronchi, lungs and pleura are treated of with great fulness, and bring up the most recent methods of diagnosis to the consideration of the reader. Diseases of the heart and blood-vessels are treated in a series of chapters, which are suggestive, deeply interesting, and worthy of careful study; but the illustrations are puzzling and vexatious.

Ministry of Munitions. Health of Munitions Workers Committee. Final Report. Industrial Health and Efficiency. Presented to Parliament by Command of His Majesty. London: H.M. Stationery Office. 1918. Folio. Pp. 182. Cd. 9065.

The Health of Munitions Workers' Committee was appointed in September, 1915, by the Right Hon. David Lloyd George, M.P., with the concurrence of the Home Secretary. The Committee was invited "to consider and

advise on questions of industrial fatigue, hours of labour, and other matters affecting the personal health and physical efficiency of workers in munitions factories and workshops."

This reference and appointment were subsequently approved by succeeding Ministers of Munitions, and this "Final Report" is submitted to the present Minister, the Right Hon. Winston S. Churchill, M.P. Of the Committee, eleven in number, six were members of the Medical Profession—namely, Sir George Newman, K.C.B., M.D., F.R.C.P., the Chairman; Sir Thomas Barlow, Bart., M.D., F.R.S., late President, R.C.P.; Professor A. E. Boycott, M.D., F.R.S.; E. L. Collis, M.B., H.M. Medical Inspector of Factories, Home Office; Sir Walter M. Fletcher, M.D., F.R.S., F.R.I.P.; and Leonard E. Hill, M.B., F.R.S., Professor of Physiology, London Hospital Medical Board.

The Committee held 39 meetings, and in addition Sub-Committees met on numerous occasions. Sittings were arranged and evidence was taken not only in London but also in Birmingham, Sheffield, Newcastle-on-Tyne, Glasgow, Manchester and Coventry. Special arrangements were also made for taking evidence at Woolwich. Witnesses were heard representative of employers, workers, factory inspectors, and other interested persons. In addition, a number of other persons placed their special knowledge at the disposal of the Committee by submitting memoranda or in other ways. The Committee decided, as we think wisely, not to publish the evidence in full, and throughout its inquiries it relied for much of its information on visits paid to factories, so ascertaining at first hand the conditions under which munition work was being carried out.

Also, from the first, the Committee was strongly impressed with the importance of obtaining exact and scientific data. For example, Dr. Leonard Hill conducted a number of detailed inquiries in regard to the dietaries of munition workers, and also in regard to ventilation.

Dr. Benjamin Moore, F.R.S., and his staff, carried out a long series of experiments and inquiries in regard to the effects of trinitrotoluene (T.N.T.) upon the health of workers. A strong Sub-Committee of scientists collected data bearing on the relationship of output to hours of work and other industrial problems. Captain T. H. Agnew, R.A.M.C., conducted, on behalf of the Committee, a medical inspection of about 3,000 male workers. Two series of medical inspections, covering altogether about 2,500 women and girls, were organised under the supervision of Dr. Janet Campbell, a Senior Medical Officer of the Board of Education.

In view of the urgency of many of the problems involved by the terms of reference to the Committee, it was decided to submit to the Ministry the views and recommendations of the Committee in regard to particular matters in separate memoranda. In accordance with this decision, the Committee submitted the following twenty-one Memoranda previous to making this final report: (1) Sunday labour, (2) welfare supervision, (3) industrial canteens, (4) employment of women, (5) hours of work, (6) canteen construction and equipment, (7) industrial fatigue and its causes, (8) special industrial diseases, (9) ventilation and lighting of munitions factories and workshops, (10) sickness and injury, (11) investigation of workers' food and suggestions as to dietary, (12) statistical information concerning output in relation to hours of work, (13) juvenile employment, (14) washing facilities and baths (15) the effect of industrial conditions upon eyesight, (16) medical certificate for munition workers, (17) health and welfare of munition workers outside factory, (18) further statistical information concerning output in relation to hours of work, with special reference to the influence of Sunday labour, (19) investigations of workers' food and suggestions as to dietary, (20) weekly hours of employment—supplementary to Memorandum No. 5, (21) investigation of the factors concerned in the causation of industrial accidents.

All of these Memoranda, with the exception of No. 17,

have been published and placed on sale. The above enumeration will lead the reader to surmise that this Final Report contains a veritable storehouse of information on points relating to Sanitation and Preventive Medicine, and this is indeed the case. Limitations of space forbid an exhaustive analysis of the Report and the findings of the Committee. But we venture to quote the introductory paragraph of the "Summary of Conclusions" (page 120) to show that the inquiry has already borne much valuable fruit. That paragraph runs substantially as follows :—

Since the Committee was appointed in September, 1915, an increased appreciation of the importance of the whole question of industrial hygiene has become apparent. There is no doubt that the environment and conditions of employment of the worker are vastly better than they were, though there is still much need for further improvement. Apart from the quickening of the national consciousness and sense of responsibility resulting from the war, this development may be attributed to three main causes—the widespread adoption of the recommendations contained in the Committee's Memoranda and Reports, the establishment of a "Health and Welfare Section" at the Ministry of Munitions, and the increased power for securing the welfare of workers conferred upon the Home Office by the "Police, Factories, &c. (Miscellaneous Provisions) Act, 1916."

La Localisation et l'Extraction des Projectiles. Par L. Ombrédanne et R. Ledoux-Lebard. Deuxième Édition remaniée. Collection Horizon. Paris : Masson et Cie. 1918. Pp. iv+305. Figs. 198; Plates 8.

The first three chapters consider fully the production of *x*-rays, their properties, and the laws governing them. Chapter IV. describes the apparatus in most general use, and the methods of protection to be employed. The authors often refer to the fact that whereas, at the commencement of the war, many of the best types of apparatus could be obtained only from Germany, now all the best models and materials can be obtained in France and the

other allied countries. Chapter V. describes the search for the foreign body, and various errors that may arise. Chapter VI. gives a full description of the different projectiles used in modern warfare, and their effects. Chapter VII., written with the collaboration of M. A. Danvillier, gives the general theories underlying various methods of localisation. Chapter IX. gives a very full and interesting account of the various methods of localisation by the formation of two images of the foreign body. Chapter X. is devoted to stereoscopic radiography. In Chapter XII. there is a discussion of the indications and contra-indications for the extraction of projectiles. In Chapter XIII. the authors describe what they call methods of precision and certitude, where the surgeon operates directly with the assistance of the *x*-rays. Chapter XIV. is devoted to points of importance in special regions. The last chapter describes some non-radiological methods such as the vibrateur of M. Bergonnié and the telephonic probe. The book is clearly written, and well illustrated both by figures and plates, and will well repay both the surgeon and the *x*-ray specialist the time spent in reading.

R. A. Stoney.

Diseases of the Male Urethra. By Irvin S. Koll, Chicago. Saunders & Co. 1918. 8vo. Pp. 151. 123 Illustrations.

This comprehensive monograph on diseases of the male urethra is a short and excellent treatise on the diagnosis and treatment of gonorrhœa.

The chapters on sexual impotence and sterility are too short and condensed to be of much use to the average medical man.

As a work on gonorrhœa the book has much to commend it, the text is clear, the illustrations are numerous and helpful. The treatments suggested are all sound and easily carried out with such instruments as are readily accessible to the general practitioner.

The book is well up to date, and is written in a very readable style.

Lecithin and Allied Substances: The Lipins. By Hugh Maclean, M.D., D.Sc. London: Longmans, Green & Co. 1918. Royal 8vo. Pp. vii + 206.

This volume is the latest addition to the series of monographs on Biochemistry edited by Dr. Plimmer and Professor Hopkins. The author states in his preface that "an attempt has been made to present the subject of the Lipins in as simple a form as the state of our knowledge permits." Whilst this can have been no easy task, Dr. Maclean is to be congratulated on having produced a very interesting volume dealing with the most complex branch of biochemistry.

The first chapter is devoted to a classification of the lipins, which include the phosphatides—Lecithin, Kephalin, Sphingomyelin and Cuorin, and the cerebrosides—Phrenosin and Kerasin. A very full account is given of our knowledge up to date of the chemistry of Lecithin and Kephalin, and it is interesting to note that a very fair attempt has been made towards the synthesis of the former phosphatide, which marks a great advance in our insight into the constitution of such complex bodies. Details are given of the different processes which have been employed for the extraction of the lipins from their natural sources.

Chapter V. deals with that complex substance which has been so long known as "Protagon," and which, as the author states, "has given rise to more bitter and acrimonious discussion among certain investigators than any other of the lipin bodies." It has now been shown that Protagon is not a simple chemical substance, but is essentially a mixture of cerebrosides and sphingomyelin.

The concluding chapter is concerned with the function of Lipins, and particularly with the part played by these bodies in the phenomena of metabolism and growth.

The author in his preface pays a well-merited tribute to the pioneer work of the late Dr. Thudichum in the domain of lipin chemistry, and points out throughout the text that many of the recent advances are but corroborations of Thudichum's previous work.

A very complete bibliography is appended. The volume is undoubtedly a valuable addition to the literature on biochemical subjects. E. A. W.

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

President—Sir John Moore, M.D. Dubl., F.R.C.P.I.
General Secretary—J. A. Scott, M.D., F.R.C.S.I.

SECTION OF SURGERY.

President—J. B. Story, F.R.C.S.I.
Sectional Secretary—A. A. M'Connell, F.R.C.S.I.

Friday, November 8, 1918.

The President of the Academy in the Chair.

Some Points about Bone-grafts.

Lieutenant-Colonel W. I. de C. Wheeler read a paper so entitled. He discussed the *rôle* of the periosteum in osteogenesis, and held that a graft is not a mere scaffolding which is ultimately replaced by new bone. The effect of sepsis on the success of bone-grafting operations was discussed, and the author believes that a graft will survive infection by all but streptococcal organisms. The results of fifteen cases of Albee's operation for Pott's caries were given. Colonel Wheeler described the technique for fashioning the graft and for fixing it in position. He emphasised the importance of the graft extending for a considerable distance above and below the sclerosed ends of fragments. Amongst the conclusions were the following:—The periosteum should be left on the graft, although it is not absolutely essential to success; it is advisable to permit the graft to functionate as soon as possible. The intramedullary plug is satisfactory in the case of the radius and the ulna; the bone graft has inherent bac-

terial-resisting properties; absolute function is essential; bone-grafting for spinal caries is followed by more uniformly successful results than are seen elsewhere.

Colonel W. Taylor said that in his experience sepsis always resulted in failure of union of the graft. He thought that splitting the spinous processes in Albee's operation increased the difficulty of the operation.

Colonel Seton Pringle advocated the use of intramedullary pegs, with long plates to act as supports.

Colonel Wheeler replied.

Surgery of the Chest as carried on at the "Front."

Colonel William Taylor read a paper in which he briefly reviewed the surgery of the lung as it is carried out at the "Front" at present. He showed that the change was simply that of harmonising or adapting the principles of surgery, as they are now applied to other wounds, to those of the lung and chest. It was estimated that the mortality due to chest wounds at the Regimental Air Posts varied from 25 to 30 per cent. At the Casualty Clearing Stations the mortality averaged about 18 to 20 per cent., while at the base hospitals the mortality was about 10 to 12 per cent. The average general mortality of chest wounds was about 18 to 20 per cent.—a state of things unsuspected at the beginning of the war. This high mortality is due to the fact that shell wounds preponderate over bullet wounds to the extent of 3 to 1. The mortality of shell wounds as compared with bullet wounds is as 14 to 1. It is the septic dangers in connection with shell wounds that render them so dangerous. The mortality is hightest during the first forty-eight hours. during which time it is calculated that 60 per cent. of the deaths occur. Open wounds of the chest are grave as compared with closed wounds. They are at least twice as dangerous. Lung wounds are like other wounds. They are contaminated by the mere entrance of the foreign body, whether it is retained or not. Like any other wound, there is an area of necrotic tissue which forms a culture medium for the growth of organisms. As with any other wound, in a few hours it will become infected and the infection will follow the same course. Twenty-five per cent. of wounds of the lung are fatal from hæmorrhage and asphyxia. Surgeons now en-

deavour to arrest the bleeding by direct surgical intervention at many casualty clearing stations. It has been shown that the operation of thoracotomy has little or no effect upon external blood pressure. Operations can be performed successfully upon the chest and lung in patients with a blood pressure as low as 50 m.m. Hg.—a point of great practical importance. The gravity of the prognosis of lung wounds is increased considerably by the frequency with which pleuro-pulmonary lesions of the opposite side occur. Infection of the hæmothorax in bullet wounds is exceptional. When there is an opening in the thoracic wall an aerobic infection from without is added to the anaerobic infection arising from the pluro-pulmonary wound. It is partly on account of this wound infection that open wounds of the thorax are so dangerous. The gravity of chest wounds from the fifth day onwards is due to pleural suppuration much more than to infection of the lung itself. The treatment of punctuating wounds of the lung depended upon whether the wound is superficial, whether the foreign body is retained, or whether the case is one of the through-and-through type. The foreign body is removed more possible together with fragments of bone and pieces of clothing. The track is cleansed and the opening into the lung is carefully closed. This closure tends to arrest hæmorrhage, and will diminish the likelihood of infection of the pleura from the lung. Primary extraction of all foreign bodies from the lung must be considered the rational treatment for preventing infection. Access can be gained to the lung most satisfactorily by an incision from the mid-axillary line to the para-sternal region over the fifth rib. Several inches of the rib are incised, and the ribs above and below widely retracted. Openings in the diaphragm must be closed. The entire pleural surfaces are wiped clean and the opening closed by careful adjustment of the tissues in layers. Drainage is not desirable, and is not employed—in fact it is positively dangerous. Gas and oxygen, or chloroform with oxygen, is the general anæsthesia used, but local anæsthesia may be employed satisfactorily. Ether must never be given. Blood transfusion is frequently given before or after the operation. Morphine is always freely given and camphor injected if necessary. Great care is taken to see that the patient never gets the opportunity of breathing cool air. Watch is kept sub-

sequent to operation for the accumulation of fluid in the pleura, and puncture is performed daily to obtain the fluid for bacteriological examination. Increasing infection of the fluid is generally treated by the removal of one or two stitches and the insertion of a drainage tube, but repeated aspiration has been successful in many cases. Duval has shown that the lung can be delivered on to the chest wall as intestine may be brought out of the abdomen.

Note on Removal of Foreign Body from the Lung.

Lieutenant-Colonel Seton Pringle read the report of a case in which a rifle bullet was lodged in the lower lobe of the lung for two and a half years. The patient suffered considerable pain on exertion, and operation was advised. Intratracheal anæsthesia was administered by Captain H. de L. Crawford. Four inches of the seventh rib were excised subperiosteally from the mid-axillary line backwards. After opening the pleura the lung was delivered through the incision. The bullet was felt about an inch deep in the lung, and it was easily extracted through a small incision. Before completely closing the pleura positive pressure was induced and the air expelled from the pleural cavity. No drainage was employed. Recovery was rapid apart from mild bronchitis. The use of intratracheal anæsthesia greatly facilitated the procedure, the number and force of the respiratory movements were entirely under the control of the anæsthetist, so that a condition of apnœa could be produced at will.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

At a Special Business Meeting, held on Thursday, December 12th, 1918, the President admitted to the Licenses of the College in Medicine and Midwifery the following candidates who had been successful at the recent Conjoint Final Examination:—Samuel Henry Berwitz, Michael Bradley, Thomas Francis Broderick, John Joseph Coman, Douglas Laird Crowe, Louis Montague Leventon, Philip John McGing, Thomas Harold Kirkpatrick MacLoughlin, Harold Larcom Mooney, Robert Henry Newman, Michael O'Brien, Valentine Rex O'Connor, Helen Gladys Rea, James Celestine Rowan.

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, November 30, 1918.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, November 30, 1918, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 42.6 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,127,268. The deaths from all causes registered in the week ended Saturday, November 30, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population :—Nineteen Town Districts, 42.6 and 46.7 ; Dublin Registration Area, 26.0 and 40.9 ; Dublin City 28.2 and 43.9 ; Belfast 61.4 and 53.8 ; Cork, 29.2 and 28.4 ; Londonderry, 31.3 and 35.9 ; Limerick, 59.6 and 62.9 ; and Waterford, 34.2 and 50.4.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, November 30, 1918, were equal to an annual rate of 0.4 per 1,000. Among the 43 deaths from all causes in Cork were 2 from diphtheria. One of the 19 deaths from all causes in Dundalk was from scarlet fever. Whooping-cough caused 1 of the 15 deaths recorded in Portadown.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock and Kingstown. The population of the area is 399,000.

In the Dublin Registration Area the births registered during the week ended November 30, 1918, amounted to 177—83 boys and 94 girls, and the deaths to 213—109 males and 104 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 14) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 26.0 per 1,000 of the population. The rate for all deaths registered during the forty-eight weeks of 1918 ended November 30 was 25.9, while in the corresponding period of the preceding ten years, 1908–1917, it had been 22.0.

The 199 deaths appertaining to the Area included 1 from whooping-cough, 1 from diphtheria, and 1 from diarrhœa and enteritis of a child under 2 years. There were registered 49 deaths from influenza—a number which is equivalent to an annual rate of 6.4 per 1,000 of the population. Of these deaths 43 belonged to the City, affording a rate of 7.3 per 1,000 of the population, and including 26 (or 8.5 per 1,000) assigned to North City Districts and 17 (or 6.1 per 1,000) to South City Districts. Six deaths from influenza (or 3.3 per 1,000 of the population) were referred to the Urban Districts of Rathmines, Pembroke, Blackrock and Kingstown. In the three preceding weeks deaths from influenza in the Registration Area numbered 204, 141, and 67 respectively.

Deaths attributed to pneumonia were 31 (comprising 7 from broncho-pneumonia, 3 from lobar pneumonia, and 21 from pneumonia, type not distinguished), as against 88, 59, and 27 in the three weeks preceding.

Tuberculosis caused 18 deaths as against 18, 20, and 26, respectively, in the three weeks preceding. Of the 18 deaths ascribed to tuberculosis, 12 were referred to pulmonary tuberculosis, 4 to tubercular meningitis, and 4 to other forms of tuberculosis.

Nine deaths were caused by cancer, 10 by organic diseases of the heart, and 23 by bronchitis.

Among the deaths of infants under one year old, 2 were ascribed to convulsions, 3 to influenza, 3 to pneumonia, 4 to premature birth, 1 to congenital malformation, and 4 to congenital debility.

Thirty-four of the deaths registered during the week appertaining to the Area were of children under 5 years of age, 24 being of infants under one year, of whom 14 were under one

month old. Forty-two deaths of persons aged 65 and upwards were registered, including 36 deaths of persons of 70 years or upwards.

Of the 199 recorded deaths 70 occurred in hospitals and other public institutions.

There was 1 case of suicide.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended November 30, and the cases under treatment at its close respectively, were as follow:—Enteric fever, 1 and 9; measles, 0 and 0; scarlet fever, 13 and 63 (exclusive of 17 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 1 and 15. Thirty-seven cases of pneumonia were admitted during the week, and 123 remained under treatment at its close. Of the deaths in hospital recorded during the week, 17 were from pneumonia.

ENGLAND AND SCOTLAND.

The mortality in the week ended Saturday, November 30, in 96 large English towns (including London, in which the rate was 32.8) was equal to an average annual death-rate of 36.5 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 23.7 per 1,000, the rate for Glasgow being 21.8, and that for Edinburgh 32.2.

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of November, 1918.

Mean Height of Barometer,	29.946 inches
Maximal Height of Barometer (13th, at 9 a.m.)	30.453 ,,
Minimal Height of Barometer (2nd, at 9 a.m.)	28.730 ,,
Mean Dry-bulb Temperature,	44.5°
Mean Wet-bulb Temperature,	42.8°
Mean Dew-point Temperature,	40.8°
Mean Elastic Force (Tension) of Aqueous Vapour	.255 inch

Mean Humidity - - -	- 87.4 per cent.
Highest Temperature in Shade (on 4th)	- 56.3°
Lowest Temperature in Shade (on 19th)	- 27.5°
Lowest Temperature on Grass (Radiation) (19th) - - -	- 24.2°
Mean Amount of Cloud, - -	- 57.9 per cent.
Rainfall (on 14 days), - -	- 2.515 inches
Greatest Daily Rainfall (on 1st), -	- 1.196 inches
General Directions of Wind, -	- W., W.S.W.

Remarks.

A month of average mean temperature. Unsettled at the beginning and close, when S.W. or W. winds prevailed. The intervening period was fine and quiet, though often dull. Sharp frost occurred on the 19th. High barometric readings were recorded daily from the 9th to the 21st, but there were very low readings on the 1st, 2nd and 4th. A complete absence of snow, or sleet, and hail was a noteworthy feature of the month.

November opened with a heavy downpour of rain; a south-easterly gale and lightning followed in the course of the night of the 1st-2nd.

During the week ended the 9th, atmospheric pressure was very unsteady, and the range was large—from 28.768 inches at 9 p.m. of the 4th to 30.321 inches at 9 p.m. of the 9th. There was a severe gale, attended by heavy rain, on the night of the 7th.

An anticyclone of great staying power lay over north-western Europe after the 11th, and did not dissipate until the 21st. It was accompanied by quiet, cold, rainless weather. On the 19th a sharp frost, haze, and smoke-fog prevailed.

The closing week (24th to 30th, inclusive) was characterised by mild, humid weather of the oceanic or westerly type and by very unstable, variable temperature.

In Dublin the mean maximal temperature was 50.0°, compared with the average, 49.9°; and the mean minimal temperature was 40.3°, compared with the average, 40.8°. The arithmetical mean temperature (45.2°) was 0.1° below the average (45.3°); the mean dry-bulb readings at 9 a.m. and 9 p.m. were 44.5°. In the fifty years ending with 1915, November was coldest in 1878 (M. T. = 38.2°) and in 1915

(M. T. = 39.9°). It was warmest in 1899 (M. T. = 50.7°) and in 1881 (M. T. = 50.3°).

The mean height of the barometer was 29.946 inches, or 0.086 inch above the corrected average value for November—namely, 29.860 inches. The mercury rose to 30.453 inches at 9 a.m. of the 13th, and fell to 28.730 inches at 9 a.m. of the 2nd. About 6 a.m. of the 2nd it fell to 28.690 inches. The observed range of atmospheric pressure at 9 a.m. and 9 p.m. was 1.723 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 44.5°, or 3.7° below the value for October, 1918. Using the formula, *Mean Temp.* = *Min.* + (*Max.* − *Min*). × .500, the mean temperature was 45.2°, or 0.1° below the average mean temperature for November, calculated in the same way, in thirty-five years, 1871-1905, inclusive (45.3°). On the 4th the thermometer in the screen rose to 56.3°—wind, S.W.; on the 19th the temperature fell to 27.5°—wind, W.S.W. The minimum on the grass was 24.2°, also on the 19th.

The rainfall was 2.515 inches, distributed over 14 days. The rainfall was somewhat below, while the rain-days were more decidedly below, the average. The average rainfall for November in the thirty-five years, 1871-1905, inclusive, was 2.720 inches, and the average number of rain-days was 17. In 1888 the rainfall in November was very large—6.459 inches on 26 days. On the other hand, in 1896 only 0.664 inch fell on 9 days. In November, 1916, the rainfall was 5.771 inches on 19 days; in November, 1917, it was 1.708 inches on 20 days.

High winds (force 4 to 7) were noted on 11 days, and attained the force of a gale (force 8) on 2 days—the 7th and 10th. The atmosphere was foggy in Dublin on the 29th. Sheet lightning was seen on the very early morning of the 2nd.

The rainfall in Dublin during the eleven months ended November 30, 1916, amounted to 35.894 inches on 209 days, constituting a record rainfall for the period. In the present year (1918), the rainfall for the completed eleven months equals 24.278 inches on 179 rain-days. In 1917 the rain-

fall up to November 30th, inclusive, was 26.779 inches on 183 days; but in 1887 it was only 15.378 inches on 141 days. In the 35 years, 1871-1905, inclusive, the average rainfall in the eleven months of the year in Dublin was 25.750 inches on 181 days.

Mr. C. M. Connolly reports that at the Normal Climatological Station in Trinity College, Dublin, the mean height of the barometer was 29.956 inches, the range of atmospheric pressure being from 28.800 inches at 9 a.m. of the 2nd to 30.460 inches at 9 a.m. of the 13th. The mean value of the readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 46.4°. The arithmetical mean of the daily maximal and minimal temperatures was 45.5° The screened thermometers rose to 58° on the 4th, and fell to 28° on the 19th. On the 19th the grass minimum was 20°. Rain fell on 12 days to the amount of 2.40 inches, the greatest fall in 24 hours being 1.20 inches on the 1st. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 54.0 hours, of which 6.2 hours occurred on the 8th. The mean daily sunshine was 1.8 hours. The mean temperature of the soil at 9 a.m. at a depth of one foot was 46.1°; at a depth of 4 feet it was 49.1°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J. Pilkington, Stirling, Clonee, Co. Meath; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin; Mr. F. Dudley Joynt, Donnybrook, Dublin; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin; Dr. Arthur S. Goff, Dundrum, Co. Dublin; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow; Mrs. Sydney O'Sullivan, Auburn, Greystones; Dr. F. O'B. Kennedy, Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 2.27 inches, on 16 days. Average, 2.84 inches on 15 days. Maximum in 24 hours, 0.99 inch on 1st. Rainfall since January 1, 27.82 inches on 175 days. Average, 26.60 inches on 172 days. Maximum temperature in shade, 55.0° on 5th; minimum, 28.9° on 19th.

Malahide.—Rainfall, 1.915 inches, on 12 days. Maximum, 0.85 inch, on 1st. Rainfall since January, 22.420 inches, on 157 days.

Clonee.—Rainfall, 2.54 inches, on 14 days. Maximum, 0.76 inch on 1st. Rainfall since January 1, 29.85 inches, on 181 days.

Phœnix Park.—Rainfall, 1.39 inches, on 14 days. Maximum, 0.958 inch, on 1st. Bright sunshine, 90.3 hours, including 7.5 hours on 6th.

Cheeverstown.—Rainfall, 1.65 inches, on 16 days. Maximum, 0.32 inch, on 7th.

Donnybrook.—Rainfall, 2.325 inches, on 12 days. Maximum, 1.200 inches on 1st.

Ranelagh—

Mean Height of Barometer	29.96 inches
Highest corrected Reading (13th, 9 hours)	30.46 ,,
Lowest corrected Reading (?)	(?)
Mean Dry-bulb Temperature	44.2°
Mean Wet-bulb Temperature	42.7°
Mean Vapour Pressure	0.259 inch
Mean Humidity	89 per cent.
Mean Maximal Temperature	51.2°
Mean Minimal Temperature	39.1°
Arithmetical Mean Temperature	45.2°
Highest Temperature in Screen (4th)	57.0°
Lowest Temperature in Screen (19th)	25.0°
Lowest Temperature on Grass (19th)	16.0°
Nights of Ground Frost	16
Rainfall on 15 days	2.84 inch
Greatest Daily Rainfall (1st)	1.47 inch
Mean Amount of Cloud	66.3 per cent.
Days of Clear Sky	4
Days of Overcast Sky	14
General Directions of Wind	S.E., W.S.W., W

Remarks.—The middle of the month was cold and dry, with not much wind, and the beginning and end were damp

and mild; the rainfall on the 1st, 1.47 inch, was exceptionally heavy, while no measurable rain fell from the 11th to the 22nd.

Dundrum.—Rainfall, 2.81 inches, on 16 days. Maximum, 1.40 inches on 1st. Mean shade temperature, 46.8°; maximum, 62° on 30th; minimum, 26° on 19th.

Killiney.—Rainfall, 2.21 inches on 14 days. Maximum, 1.04 inches on 1st. Average (24 years), 2.880 inches on 16 days.

Greystones (Rathdown House).—Rainfall, 3.05 inches on 14 days. Maximum, 1.34 inches on 1st.

Greystones (Auburn).—Rainfall, 2.50 inches on 15 days. Maximum, 1.05 inches on 1st.

Newcastle.—Rainfall, 2.94 inches on 13 days. Maximum, 1.20 inches on 1st. Mean temperature, 44.3°; maximum, 63° on 29th; minimum, 24° on 19th; mean maximum, 51.0°; mean minimum, 37.7°.

Enniskymon.—Rainfall, 4.21 inches on 19 days. Maximum, 0.60 inch on 27th.

Castleconnell.—Rainfall, 3.90 inches on 19 days. Maximum, 0.78 inch on 10th.

Dunmanway.—Rainfall, 5.17 inches on 21 days. Maximum, 1.03 inches on 7th. The observer writes:—No rain from 13th to 21st inclusive. Most of the heavy rain fell at night. Frost occurred on the nights of the 2nd, 17th, and 18th. It was a mild month, particularly in the last week.

LITERARY NOTE.

William Heinemann (Medical Books), Limited, 20-21 Bedford Street, London, W.C. 2, will shortly publish a work on "Pensions and the Principles of their Evaluation," by Drs. Ll. J. Llewellyn and A. Bassett Jones.

The subject is of international importance, and its appearance at this juncture is most opportune. It deals with Pensions, both in their political and in their medical aspects. The book, it is hoped, will prove valuable to all those who are interested in Pensions, Assurance and Compensation, while supplying ample food for thought to political and social reformers.

Translations of the work into both French and Italian are being arranged.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about two hundred and fifty dollars, will be made on July 14, 1919, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered. Essays intended for competition may be upon any subject in Medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation. They must be received by the Secretary of the College—Francis R. Packard, 19 South 22nd Street, Philadelphia, Pa., U.S.A.—on or before May 1, 1919. Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award. No Alvarenga Prize for 1918 was awarded.

THE NATIONAL UNIVERSITY OF IRELAND.

At a meeting held on Thursday, December 12th, 1918, the Senate decided that a Travelling Medical Studentship in Anatomy should be offered for competition in 1919, in addition to the Travelling Medical Studentship already offered for competition under the Regulations. On the report of the Examiners the Senate made the following awards:—The Dr. Henry Hutchinson Stewart Medical Scholarships—In Anatomy—James Hayden, University College, Dublin. In Physiology—Francis John Henley, University College, Cork. The Senate decided to grant certain exemptions to students of the University who have served in H. M. Forces during the war. The following resolution was passed unanimously, on the motion of Professor George Sigerson, seconded by the Right Hon. M. F. Cox:—"That, having protested at the time against the barbarous destruction of the famous Library of Louvain, we now appeal to other Universities, Colleges, and Societies to co-operate in an effort to enable the University of Louvain to re-create a great Library."

THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

FEBRUARY 1, 1919.

PART I.

ORIGINAL COMMUNICATIONS.

ART. IV.—*Ireland and a Ministry of Health.*[a] By T. HENNESSY, F.R.C.S.I.; D.P.H. Irish Medical Secretary, British Medical Association.

WHEN Sir William Thompson, President of the Section of State Medicine of the Academy, invited me to read a paper on the Ministry of Health Bill, I understood his wishes to be that I should address myself as to how the medical situation in Ireland could be fitted in with a Ministry of Health established for this country.

With that object I have studied the proposals put forward by the British Medical Association for the establishment of a Ministry of Health for Great Britain, and from these proposals I have freely borrowed as many ideas as I am of opinion can be included in an Irish Ministry of Health. I may, however, state here that my views are unofficial and non-committal so far as the profession in Ireland is concerned.

Perhaps not the least of my few qualifications to deal with Irish medico-political questions is that I was for

[a] Read before the Section of State Medicine in the Royal Academy of Medicine in Ireland on Friday, January 17, 1919.

almost twenty years, in the Co. Tipperary, a dispensary doctor in the Poor Law Medical Service under which, as I will show you later on, between 50 and 70 per cent. of the Irish population are at present receiving free medical treatment as "poor persons," or to use a word more offensive to Irish pride, but not less accurate—paupers. That this is the case is not the fault of the Irish people, but it is entirely due to our legislators, who are too indifferent to make themselves acquainted with the medical needs of this country, or to take the advice of those who can best give it.

Though the late Chief Secretary for Ireland, Mr. Shortt, stated it was his intention to introduce into Parliament a Bill to establish a Ministry of Health for this country, yet he did not consult, in regard to this complicated problem, any medical body representative of the Irish Medical Profession either to ascertain their views or to enlist their support. It is, however, to be hoped that his successor in office will take steps at an early date to remedy the omission of his predecessor.

It is generally agreed that the main function of a Ministry of Health should be to secure the development and administration throughout the country of adequate health services. That Ireland is in need of such legislation more than any other country in Western Europe, there will be found few medical men acquainted with Irish health questions to dispute. If, however, legislation is to meet the peculiar medical and economic conditions which exist in this country, they must be dealt with by a measure entirely separate from the English and Scottish Bill recently introduced into Parliament.

The main principles governing the establishment of a Ministry of Health either for Great Britain or for Ireland, for central organisation, are :—

(1) That a Ministry of Health should be created to take over the complete control of all the health services belonging at present to the different Government departments.

(2) That the administrative functions of the Ministry of Health should be carried out by a central body called the Board of Health, presided over by a Minister of Cabinet rank.

(3) That to this Board of Health should be transferred, in Ireland, (*a*) the duties of the Local Government Board with regard to health; (*b*) the duties of the Home Office with regard to the inspection of workshops and factories, and those of the Board of Trade, *e.g.*, medical inspection of ships; (*c*) the Irish Insurance Commission; (*d*) administration of lunacy laws; (*e*) health functions of the Privy Council with regard to midwives, &c.; (*f*) Education Extension Act, 1915, and medical inspection of school children.

(4) That on the "Board of Health" there should be members of the medical profession representing, in equal numbers, the clinical and preventive sides of Medicine. There should be appointed in connection with the Board of Health, a consultative council for giving advice and assistance in relation to all health matters. The major portion of the medical representatives on such a council should be selected by the profession as a whole.

For Local Organisation.—The country should be divided into such suitable administrative areas—which might correspond with the existing Local Government areas or combinations thereof—as will require the services of whole time administrative medical officers, both clinical and preventive. In each of the county and county borough areas there should be formed, for administrative purposes, a "County Health Committee" and a "Borough Health Committee" respectively. These Health Committees should consist of representatives (*a*) of the rating authorities, *e.g.*, county councils; (*b*) of the education authorities; (*c*) of insured persons and employers of labour, *e.g.*, those contributing to a scheme of health insurance; (*d*) of the medical profession; (*e*) of public hospitals; (*f*) of dentists; (*g*) of pharmacists and (*h*) of nurses.

The Borough and County Health Committees should have the option, with the approval of the Central Board of Health, of appointing in their administrative areas sub-committees, called "District Health Committees," to which certain administrative duties might be assigned. These district health committees should, in relation to the Borough and County Health Committees, take within certain defined limits the place of Boards of Guardians and District Councils so far as these bodies are at present concerned with the administration of health questions. The different interests represented in the Borough and County Health Committees should be provided for as far as practicable in the District Health Committees. The principal medical officers of each Borough and County Health Committee should be two, who should be of equal status and whole time officers; one representing the clinical side (Chief Clinical Officer), and the other the preventive side of Medicine (Medical Officer of Health). The duties of the Chief Clinical Officer should be to advise on questions of medical treatment in its different aspects. The duties of the Medical Officer of Health should be those in connection with Preventive Medicine generally. The present Medical Officers of Health in the dispensary districts should act as his assistants within the areas assigned to him. There will be also required a number of whole-time Medical Inspectors, who might act as Medical Referees under the Insurance Act, Medical Inspectors of schools, and carry out public health inspections under the County Medical Officer of Health. For each area the County Health Committee should establish hospitals, including, where necessary, sanatoriums, clinics (including natal and prenatal maternity, and child welfare), nursing schemes, and medical and dental inspection of school children. Those entitled to treatment should be able to obtain institutional, consultative, and specialist services on the recommendation of their medical attendant. There should also be provided, within easy reach, pathological laboratories.

I am of opinion that the schemes I have outlined will, for the purposes of discussion, serve as the framework of an Irish Ministry of Health, which can be applied to this country only by accompanying it with a radical reform of the Irish Poor Law Medical Service under which, in my opening remarks, I stated that between 50 and 70 per cent. of the population in Ireland receive free medical treatment and medicine. It is, however, by the gross abuse of the Medical Charities Acts that so many people in this country receive free treatment. If the Medical Charities Acts in Ireland were administered as rigidly as similar Acts in England are, no wage-earners, including their dependents in most cases, would receive free medical treatment in this country. That the abuse of the Irish Poor Law Medical Service is so extensive is, as I have already said, not the fault of the people who, in many cases, are reluctantly compelled to avail themselves of it owing to the failure of the State to provide them, as in England and elsewhere, with a medical service within their reach on a contributory basis. Outside the half-dozen county boroughs and a few urban centres, the population of Ireland is mainly rural and sparse, which, for the doctor, whether he is a Poor Law Medical Officer or a private practitioner, means long and expensive journeys to visit his patients. Indeed it must be admitted that if a doctor were to give his time and professional services for nothing and only charge for his travelling expenses, it would debar comparatively comfortable people from availing themselves of his medical treatment. This can be better appreciated when I tell you that in the great majority of cases in rural Ireland the car-hire at hackney rates would average 10s. a visit, and as much as £1 per visit at taxi or garage rates. In this respect it is well also to bear in mind that there is many a dispensary doctor's district fifteen miles in length by ten or twelve miles in breadth.

The statistics in the annual reports published by the Local Government Board for the past three years (which do not include 1918 with its influenza epidemic) show

that on an average for each of these three years the dispensary doctors attended and registered, as poor persons or paupers, 610,322 new cases! Of these about one-third were attended at the patients' homes. Though to you the number registered may be surprisingly high, yet it does not represent half of those actually attended, particularly of those patients who came to the dispensaries for their treatment. The medical attendance on Poor Law patients is never registered unless they present tickets. Poor Law patients, for different reasons, have an objection to provide tickets. Presentation of tickets to the dispensary doctor means no money to him, directly or indirectly; they only mean to him a huge amount of clerical work for which he has neither the time nor the inclination. The result is that he is agreeably pleased to be spared the trouble of registering them. His pleasure and satisfaction come in time to be appreciated and shared by the more observant of his patients, and thus it comes about that as many as half the new cases attended by the dispensary doctors are not registered and are not included in the statistics given by the Local Government Board. The incidence of sickness amongst potential Poor Law patients is, one year with another, about one in two. The number registered as being attended as new cases we find an average for each year to be as already stated 610,322, but for the reasons I have given we must at least double this number to arrive at the number actually attended, namely, 1,220,644. Now, with the incidence of sickness as one in two, it is easy to calculate that the Irish dispensary doctors are liable to attend almost 2½ millions of the Irish people as "paupers" or "poor persons." The incidence of sickness may be high, but this should be expected in the case of patients who get their medical treatment and medicine for nothing. For their actual work, and liabilities for the treatment of 2½ millions of people, the dispensary doctors received in the year 1917 a total of £109,604 in so called salaries, or on an average, approximately £130 per annum, which is considerably less than

half what would be charged by a posting establishment or a garage for the gross mileage covered in travelling to and from the patients who were attended at their homes. All this is indeed hard enough, but a more cruel and appalling condition of affairs has to be told. It is by no means unusual to find a dispensary doctor of 75 years of age valiantly trying to discharge the duties of a dispensary district some twelve miles long by almost as many broad. Sparsely scattered through such a district there are between 4,000 and 5,000 people solely dependent for their medical treatment on this venerable if infirm doctor. An English Chief Secretary for Ireland, in his capacity as President of the Local Government Board, and in his ignorance of Irish medical matters, will probably ask why he does not resign? The answer is he cannot afford to do it, he was unable to put anything aside for his old age out of his miserable salary of £120 or £130 a year. His chances of a pittance of a pension are slender—he must die in harness. Just imagine the inhumanity of such a man having to work 20 out of the 24 hours, travelling the length and breadth of his vast district, in bleak winter weather, in his efforts to cope with the recent epidemic of influenza! All this is very bad for the dispensary doctors, but what about the unfortunate people who are dependent for their lives on such an ill-requited medical service? It was the existence in this country of this Poor Law Medical Service that was made a pretext for deleting the medical benefits form the Insurance Act in its application to Ireland. The question now is, will history repeat itself in the case of the extension of the Ministry of Health legislation to Ireland?

The provisions made for the administration of the Public Health (Ireland) Act, 1878, are farcical in their application. In this country there are no whole-time, part-time, or any kind of County Medical Officers of Health. The dispensary doctor is the Medical Officer of Health of the district assigned to him for the discharge of his duties under the Medical Charities Acts. The average population for whose "public health" he is responsible is be-

tween 4,000 and 5,000. His salary is usually about £15 per annum, sometimes a few pounds more, but as frequently a few pounds less. His Board of Guardians, under the name of the District Council, is the Executive Sanitary Authority. The same Board of Guardians, "alias" District Council, is his employer in almost all his official capacities, which are as many and various as Gilbert assigned to his Japanese official "Pooh Bah," but with a very marked difference—actual and potential—with regard to the solaces of remuneration. He is also dependent on the good-will of his Board of Guardians for his private practice. The members of his Board of Guardians and their friends are as frequently as other members of the community misdemeanants against the sanitary laws, so that if its Medical Officer of Health had the temerity to report his patrons to themselves he would be asking them in their executive capacity to execute themselves, which is an admittedly awkward and uninviting performance in every sense. With these few remarks we can agree to quit the Irish sanitary burlesque.

In dwelling so much on the appalling drawbacks of the Irish Poor Law Medical Service my object is to make, in the interests of its Medical Officers and the public health of Ireland, an imperative case for its immediate reform, so that it can be adapted to the best advantage to fit in with a Ministry of Health for this country. To prepare you for some suggestions I am about to make for the reform of the Irish Poor Law Medical Service I will now quote for you as briefly as possible some recommendations by Irish Commissions and Irish Conventions which cannot be ignored if we desire to accomplish our purpose.

In 1906 the Vice-Regal Commission published its Report on Poor Law Reform in Ireland. It recommended amongst many very important reforms, a State Medical Service for County and Poor Law Hospitals, the cost thereof to be defrayed out of money voted by Parliament. The entrance into this State Medical Service was to be by competitive examination.

The Irish Convention, appointed in the year 1917 for the purpose "of drafting a constitution for their country which should secure a just balance of all the opposing interests," recommended by 42 votes to 18 : "That there shall be a Civil Service Commission consisting of representatives of Irish universities which shall formulate a scheme of competitive examination for admission to the public services, including statutory administrative bodies." In the statutory administrative bodies mentioned in this recommendation are included the appointments made by Boards of Guardians. I may here remark, by way of parenthesis in connection with this recommendation, that the minority vote (18) was comprised of Ulster representatives who, apart from the merits of this question, seemed for the purpose of political strategy constrained to vote against the majority. The majority of 42 included Roman Catholic Bishops, County Councillors, and others who might not be expected to support such a recommendation as it practically deprived those whom they represented of all their patronage. Whatever may be our individual political views we can all, as Irishmen, rejoice at this finding of the Irish Convention, as it at once places Ireland as the pioneer of a movement that we all hope may become world-wide for the abolition of existing patronage and its vitiating abuses.

In 1913 a Departmental Commission was appointed by the Treasury with regard to the extension of medical benefits to Ireland. The majority reported in favour of the extension of medical benefits to the six county boroughs, but at the time did not proceed with the inquiry in regard to the rest of Ireland.

In 1910 a referendum of the Irish profession was taken and considerably over 90 per cent. of the entire profession voted for a National Medical Service with entrance by competitive examination, and placed under control of a Board containing a due proportion of medical men elected by the service, with laymen chosen by the County Councils.

In 1917 the Irish Medical Committee, an executive body representing the entire Irish profession, endorsed the recommendation of the Irish Poor Law Medical Committee, which approved of the principle of the establishment of a Ministry of Health for Ireland, and urged that any legislation for this purpose should embody the unification of all the different medical services on the lines of a national service with entrance by competitive examination, and compulsory superannuation.

To meet the peculiar position of medical affairs in Ireland, and their relation to the political and national situation. I do not propose to advocate a State service, by which is generally understood medical treatment for rich and poor, and for which doctors are paid a fixed salary by the State. In such a service there could be really no free choice of doctor by the patient, and I am fully convinced that people who can pay for their doctor will never forego the privilege of selecting him, notwithstanding its exercise will occasionally result in a catastrophe owing to the preference of the laity for the unctuous gentleman with the "bedside manner." I am strongly of opinion, according to the areas we have to deal with in Ireland, we must adopt a more or less mixed system. As I quoted a while ago, a Departmental Committee in 1913 recommended the extension, under the Insurance Act, of medical benefits to Ireland with free choice of doctor, for the six county boroughs. It is to be remembered that in their report provision for treatment was made not only for the insured persons, but for the inclusion of their dependents at capitation rates. The capitation rates offered by the approved societies were ridiculously inadequate. The unreasonable attitude, with regard to remuneration, of many of the Approved Societies was, of course, influenced by their experience of the fact that they could always fall back on the abuse of the Medical Charities Acts for the treatment of the majority of the insured and their dependents. Anyhow, so far as I know, nothing at present exists to prevent the insured persons and their

dependents, in the six county boroughs, having the advantage of the medical benefits of the Insurance Act, if the Irish Insurance Commission and the Approved Societies are prepared to meet the doctors in a reasonable spirit. Nor do I see the difficulty of providing medical benefits on similar terms and conditions for some dozen or fifteen of the larger urban areas outside the six county boroughs.

Now I come to the rural areas, for which I must propose an entirely different scheme. Nine out of every ten rural districts are one-doctor areas. That they are so is due to the economic factor that there is very much less than a living for one, and thus it is that it is so rare to find a second doctor in these areas. When he is there it will be found he is not dependent for a living on his practice, and that he merely runs it as a side show. It is in these districts that the advantage, or disadvantage, of a patient exercising the right of a choice of a doctor does not exist. More important to the public than the choice of one of two doctors in these areas is to place one doctor on such an economic basis that he shall be financially in a position to set aside sufficient of his salary to pay for the necessary conveyances to give adequate and speedy attendance to those who are depending on him for their medical treatment. This may look like making a monopoly for the dispensary doctor, but he has been always a monopolist, though the monopoly in the past was of a willy-nilly philanthropy and penury. For rural areas I would propose a medical service with entrance by competitive examination, open to both sexes. The successful candidates should be granted a choice of vacancies, *e.g.*, "dispensary districts," in the order of merit in which they were placed in the competitive examination. The doctor having selected his district should assume office under the County Health Committee in which his district is situated, and be put in touch with any District Health Committee which might be appointed for his district or a combination of districts corresponding to the present union area. His public duties would be to attend all insured persons and their

dependants, the destitute poor, and possibly some others. Amongst the latter I think small or cottier farmers and their dependants should come under the medical benefits of the Insurance Act on a compulsory and contributory basis. This class I would limit to persons in possession of land with a carrying power of up to four or five dairy cows or their equivalent if other systems of farming are adopted. He would also act as assistant Medical Officer of Health for his district under the County Medical Officer of Health. For all this work, in the average district as at present constituted, he should be paid a minimal salary of £350 per annum, with yearly increments of £10 until a maximum of £500 is attained. He would, of course, be permitted to engage in private practice in his locality. His office should be pensionable on the lines of the present or some other Civil Service scheme. He should be liable to be compulsorily retired on pension at the age of 65, or at any time earlier, if from any cause he is unfit to discharge his duties. In the event of meeting a fatal accident, or contracting a fatal illness in the discharge of his duties, sufficient provision should be made for his widow and children if he had any. In cases where the injury or illness does not end fatally but renders the Medical Officer permanently unfit to discharge his public duties provision also should be made for him by way of compensation, either in the form of a yearly pension or by giving him the alternative of a lump sum.

Provision should be made in the Irish Medical Service for promotion within itself. All the higher appointments, including inspectorships, &c., should be filled, after a limited time, by selection from the rank and file. Promotion should be made on the basis of the length and character of service, post-graduate study, particularly when this takes the form of attaining one or more of the higher diplomas in Medicine, Surgery, Obstetrics, and Public Health.

As compared with the salary the dispensary doctor is at present paid, which is, with very few exceptions,

the same as it was fifty years ago, when the purchasing value of £1 was equal to £4 now-a-days, it may appear to the public authorities that I propose to remunerate him very handsomely. It must, however, in this respect be remembered I have added, at an inclusive salary, very much to the duties at present discharged by him. Moreover, when £200 are deducted for the working and travelling expenses incurred in discharging his public duties, his initial salary will be reduced to £150 per annum, which is less than half what a skilled mechanic would work for with very much shorter hours. At the time he reaches his maximal salary his responsibilities will have increased and he will have to make provision for the education of his children at boarding schools, owing to the lack of any local opportunities for an education that would equip them to earn their livelihood. The amount the doctor will make in private practice will not add very much to his total income.

With regard to the Public Medical Service I have outlined for rural areas there will be very likely some thoughtless critics to point out that entrance to this service, by competitive examination, with the resulting elimination of a free choice of doctor, flavours very strongly of a State service. To such critics I would point out that the services I am dealing with have been always, in England and Ireland, of a State character, inasmuch as the Boards of Guardians made the appointment by election, and for such election I propose nothing more revolutionary, or reactionary if you like, than substituting a system of competitive examination to fill all vacancies. Moreover, I am dealing with one-doctor areas and appointments, in which the economic factor absolutely does away with the possibility of there being a choice of doctor. In this respect, too, it would be futile to ignore the political aspect which is involved in the recommendation of the Irish Convention, which I quoted. I am not losing sight of the workhouse doctor, though after a time, as a result of the reform of Poor Law medical service and the amalgamation of unions, I am of opinion his position as such will gradually dis-

appear and that he will find himself in charge of a county or district hospital run under a new system and on entirely different lines. His interests should be protected, and, wherever practicable, his services made use of in the newer institutions and at an adequate salary. His office in relation to appointment and pension should be on similar terms to that of the District Medical Officer.

In any reform of the Irish Medical Services the position of the County Infirmary Surgeons should also be taken into account, and it should be adapted to fit in with the new Medical Service so that the existing County Surgeons should share in all the advantages of such a Service.

I do not know that I am called upon to apologise for having dwelt so much on the material side of a reformed Medical Service as it effects our profession, but I fully realise that doing medical work on quasi-charitable lines for people who can afford to pay for it, either as private patients or on a contributory basis, must come to an end, both in the interests of the doctors, who cannot live on air, and of the public, who cannot, whilst able to pay, expect their best service for nothing. Even supposing that we establish our relations on a business footing with the better-to-do portion of the public, there will still remain plenty of opportunities for the exercise of medical philanthropy, a trait of our profession with which none of us wish to take a final leave.

ART. V.—*The Diagnosis and Treatment of Syphilis.*[a]
By GEORGE E. PUGIN MELDON, M.D. Univ. Dubl., F.R.C.S.I.; Senior Surgeon to the Westmorland Lock Hospital, Dublin; President of the Dublin University Biological Association.

MR. PRESIDENT AND GENTLEMEN,—My first duty is to thank the members of the Dublin University Biological Association for the very great honour they have done me

[a] The Presidential Address to the Dublin University Biological Association delivered at the Annual Meeting held on Saturday, November 30, 1918.

in choosing me for their President. Looking back at the illustrious list of Presidents of the Association and the splendid addresses that have been delivered before you, I cannot help feeling how incapable I am of maintaining their high standard. Still I think that none of them appreciated the honour more than I do, or felt more proud of the Association. Indeed, never before was there more cause for honest pride than now, when we think of the number of its past and present members who, hearing their country's call, went forth on land and sea and nobly upheld the honour of their Alma Mater. Many of them, alas! will return no more, but their names and deeds live, and add to the splendid records of our University.

I have selected as the subject of my inaugural address the Diagnosis and Treatment of Syphilis for several reasons; chiefly perhaps because I hope that the importance and interest of the subject may in some way atone for the shortcomings of this paper.

For years, or rather centuries, the fight against syphilis has been of the nature of trench warfare in which we have been content to hurl at the enemy missiles of mercury and iodide of potassium, with perhaps here and there some slight local success, but with no real advance. Within the past few years a change has taken place and we have gone over the top, have carried the enemy's primary system and are fighting our way through his secondary entrenchments. Though the advance has been considerable there still remain many obstacles ahead, and there is plenty of opportunity for original work for the members of the "Bi" to exercise their ingenuity and ability.

The earlier records of syphilis are obscure, and for all practical purposes it appeared as a new disease in Europe in the year 1494, although it had long been known in the New World.

There is little doubt that the Spaniards who sailed with Columbus on his first voyage became infected, and on their return introduced this disease into Europe at a most

opportune time for its wide distribution, when Charles VIII. of France invaded Italy, and it is believed that the disease was spread by the Spanish soldiers. The French with their natural politeness called it the Disease of Naples, while the Italians, not to be outdone in courtesy, called it the French Disease. The now familiar name was given to it by the widely read poem "Syphilis sive Morbus Gallicus," written in 1530 by the poet, physician, and philosopher Fracastoro.

Although syphilis was recognised and extensively written about, it took close on three centuries before gonorrhœa was regarded as a separate disease, and another fifty years before the establishment of the distinction between syphilitic and soft chancres.

After the discovery of the gonococcus by Neisser in 1879, and of the bacillus of soft chancre by Ducrey ten years later, many careful observers vainly searched for the pathogenic organism of syphilis. A great impetus was given to these investigations when Roux and Metchnikoff showed that syphilis could be transferred to some of the lower animals and so could be subjected to experimental conditions.

Finally in 1905 Schaudinn and Hoffmann discovered the organism which is now recognised as the cause of syphilis, the Spirochæta pallida.

This organism was regarded as a protozoon and so syphilis was believed to be related to other protozoa diseases, which supposition has led to a clearer conception of, and a vast improvement in, the treatment of syphilis.

The presence of the Spirochæta pallida has been demonstrated in every class of syphilitic lesion but it is most often sought for in the primary chancre.

At first one is struck by the ease with which it is found in one case, while in similar lesions in other patients it is sought for in vain. With experience, however, the number of syphilitic sores which yield a negative result will diminish.

In looking for this organism two points are well worth bearing in mind.

Firstly, it is the exudate from the base and margins of the sore that is rich in spirochætes, which seldom can be found in the debris on the surface.

Secondly, if the sore has been recently treated with antiseptics, especially mercurial preparations, the search is useless.

Shortly after the discovery of the Spirochæta pallida as the causative agent of syphilis, Wassermann, Neisser and Brück applied the Bordet Gengou complement fixation test to the serum diagnosis of this disease, and it became known as the Wassermann reaction.

When Wassermann introduced this test he used as his antigen a substance rich in spirochætes, namely, an extract of liver from a case of congenital syphilis, and the complement fixation was looked upon as a specific reaction between the toxins of the spirochætes and the antibodies present in the serum of syphilitic persons.

Soon, however it was found that the extract from a non-syphilitic liver, or other organs such as the heart, would act just as well, and also that some lipoids, such as cholesterine, would increase the reaction.

Although this discovery showed that the complement fixation could no longer be looked upon as a specific antigen-antibody reaction and deducted from its theoretical value, still experience has demonstrated that the reaction is a reliable clinical test for syphilis.

When this test first came into use it was thought that the substance present in the serum, which fixed the complement, was of the nature of an antibody. Very soon, however, this hypothesis was discarded both on theoretical and clinical grounds.

The next supposition was that the reaction resulted from the presence of toxins of syphilis in the serum. Some support was given to this theory by the fact that an increase in the strength of the Wassermann reaction was often noticed at the commencement of treatment. A patient with a negative or doubtful positive Wassermann reaction frequently develops a strongly positive one as a

result of the destruction of a large number of spirochætes and the setting free of their endotoxins. Upon this theory, however, it is difficult to explain old standing cases presenting no clinical signs of syphilis, which give a strongly positive reaction apparently unaffected by energetic treatment.

The theory that I hold at present is that the Wassermann bodies result from the destruction of tissues caused by the toxins of syphilis. This seems to give the most satisfactory explanation of the various phenomena of the Wassermann test, and it also serves to explain why a positive result in other diseases sometimes develops.

Anyway, that is the hole I am in at present concerning the theory of the Wassermann reaction; if any of you know of a better hole I hope you will show it to me.

The following non-syphilitic diseases and conditions have been reported as occasionally giving rise to a positive Wassermann reaction. Firstly, there are some protozoa diseases closely related to syphilis, as, for example, Yaws. I have no practical experience of these, but, *à priori*, it is to be expected that they would give this reaction. Secondly, there are some diseases associated with much tissue waste, such as advanced carcinoma and late tuberculosis. These, I believe, sometimes give rise to a partial positive reaction, but I have never seen a fully positive one result from them. Thirdly, some observers have occasionally found a transient positive Wassermann reaction in some acute febrile disorders such as malaria, pneumonia, enteric, and scarlet fever. Fourthly, in a few cases the serum of patients under general anæsthesia, and also on some occasions blood taken *post-mortem* have been reported positive. Recently trustworthy serologists have failed to verify some of the positive reactions in non-syphilitic cases reported by earlier observers.

However, as far as my experience goes, a fully positive report by a competent serologist means that, excluding such a condition as Yaws, the patient is, or has been, suffering from syphilis.

A partially positive Wassermann reaction in a patient who has no obvious wasting disease, points strongly to syphilis, but I think it is wiser to have a second test made after a provocative injection of salvarsan before making a definite diagnosis.

A sphere in which this test is of the greatest importance is in syphilitic disease of the central nervous system.

The cerebro-spinal fluid is contained in a closed sac and is not affected by changes in the blood unless its endothelium lining is damaged and the blood contents are admitted to the fluid, as in meningitis.

It follows from this that an examination of the cerebro-spinal fluid is necessary before a definite diagnosis of syphilitic disease of the central nervous system can be made. A positive Wassermann reaction in the cerebro-spinal fluid is practically conclusive evidence of syphilitic disease of the nervous system, the only exception being in the case of a patient with a positive reaction in his serum who is suffering from a non-syphilitic meningitis. A negative Wassermann reaction indicates that the nervous system is not involved, with the following exceptions :— (1) In very early acute meningitis, during the secondary stage, the fluid may be examined before it has time to become positive ; (2) the fluid may become negative owing to treatment, but, on account of the disease not being fully eradicated, relapse is possible ; (3) in some cases of purely cerebral lesions the fluid drawn off by lumbar puncture may be negative.

I shall now consider, briefly, the treatment of syphilis. From the very earliest times, until a few years ago, mercury had been looked upon as practically the sole remedy against syphilis, and opinions differed only as regards its mode of administration, and the duration of treatment. Other drugs, such as iodide of potassium, were found useful adjuncts in certain manifestations, but were incapable of replacing mercury. Treatment by mercury has gone from one extreme to another. At one time it was carried out with such vigour that patients not infrequently succumbed

to the effects of mercurial poisoning, or to weakness caused by the profuse salivation then considered necessary. In fact, at that time the treatment was often worse than the disease. When the pathogenic organism of syphilis was found to be probably a protozoon, various drugs that had been found beneficial in other protozoa diseases, such as sleeping sickness, were tried with success. One of the first of these was an arsenical preparation known as atoxyl, which was followed by other similar preparations. Very good results attended the administration of these drugs, but they had to be discarded, because it was found that there was a danger of optic neuritis following upon their use. This led to a further research for a less toxic preparation, resulting in Ehrlich's discovery, in the year 1909, of salvarsan, and later of neo-salvarsan. When salvarsan first came into use we had hopes, especially in early cases, that one injection would eradicate the disease. But very soon it became apparent that we were unduly optimistic. The next step was the increase in the number of injections to three, given at intervals of one month. Mercury was given between the injections and its administration was continued for some months subsequently. This method of treatment gave encouraging results and many apparent cures followed. Latterly it has been found that we get better results from more numerous injections of salvarsan or neo-salvarsan, given in somewhat smaller doses, and these at shorter intervals. Records have been published comparing the effects of intravenous injection of salvarsan and intramuscular injection of neo-salvarsan, which show that, serologically at all events, the latter method has given the better results. This is a point of interest as still further showing that the more continuously the system has been flooded with these drugs, the more promising have been the effects of treatment. At the present time I think that all workers in this branch of the profession will agree that we are in a position to promise a definite cure, in a comparatively short time, to patients who present themselves

for treatment while yet in the primary or early secondary stage of syphilis.

In the later stages of the disease one does not yet feel justified in making such a definite prognosis, but the time may not be far distant when we can do so.

The method which I adopt is to give a course of some six or eight injections of salvarsan or neo-salvarsan, combined with mercurial treatment, extending over a period of some twelve weeks. In early syphilis this may suffice, but in later cases more treatment may be required. Each case must be largely treated on its own merits, the mode and amount of treatment depending on clinical data and serological findings.

There is just one point in the treatment of primary syphilis that deserves special mention. This is the local energetic treatment of the chancre. For it is here that there is most danger of some spirochætes escaping and giving rise to a recurrence.

In syphilis of the central nervous system, if treatment is started early, before there has been actual destruction of nerve cells, and while the disease is still confined to the vascular and intercellular tissues. I believe one may hope for as good results as are got in the later syphilitic lesions of other parts of the body. In nervous syphilis experience has taught us that intravenous injections of salvarsan and neo-salvarsan are just as effective as intrathecal injections of salvarsanised serum.

Before I finish I would like to say a word in praise of the splendid way the Royal Army Medical Corps has dealt with the great problem of venereal disease, both before and during the late war. Nearly all our recent improvements in treatment and prognosis are due to their work and statistics. For this a huge debt of gratitude is owing to them, not only by the Medical Profession, but by humanity at large.

ART. VI.—*The Diagnosis and Treatment of Syphilis.*[a] By LIEUT.-COL. H. C. DONALD, R.A.M.C., M.B., C.M., F.R.C.S. (Edin.); Officer in Charge, Military Hospital, Spike Island.

THE only point in diagnosis I would like to touch on and emphasise is the routine examination of all venereal sores by the aid of the dark ground illumination. How often do we meet cases with developing or advanced "secondaries," which give the history that some weeks previously they had a slight abrasion of the penis which healed itself with no treatment or perhaps the application of a little black wash obtained at the nearest chemist's.

Every practitioner who is treating syphilis must acquaint himself with the technique of demonstrating the Spirochæta pallida by the dark ground microscope and make a routine practice of its use. If he fails to find the S. pallida on his first scraping he must make many examinations. Antiseptics should not be used to heal venereal sores until the dark ground examination is completed and the organism is demonstrated or otherwise: indeed, the sore should not be healed till such time. Vigorous local treatment should then be commenced by mercury or by hectine. I have seen cases of innocent looking abrasions, and cases of supposed scabies being at once confirmed as syphilis by the dark ground microscope. A sore that has been treated with antiseptics will not show spirochætæ, and should be dressed with normal saline for a few days before the examination. Sometimes help is obtained in these cases by puncturing with a hypodermic needle a neighbouring enlarged gland which may clear up the diagnosis when the serum is examined under a dark ground microscope.

Again, in what seems an ordinary case of balanitis a careful examination must be made for any abrasion or other lesion on the glands or surrounding parts and a microscopic examination of these must be carried out.

[a] A communication to the Annual Meeting of the Dublin Biological Association held on Saturday, November 30, 1918.

It is well to keep such doubtful cases under observation for three or four weeks if possible. It will thus be seen that the routine use of the dark ground microscope in diagnosticating the exact nature of a venereal sore is invaluable and will often save time in commencing anti-syphilitic treatment to the benefit and cure of the patient, when otherwise one would require to wait till such time as the blood would reveal the condition. As the stethoscope is to the physician so is the dark ground microscope to the syphilclogist in importance.

As to the great importance of early diagnosis of syphilis it has been shown that the chances of cure from a full course of "606" and Hg. mercury are as follow—in primary cases approximately :—

(1) S. pallida present—Wass. – & – after provocative dose, 100 per cent. cures

(2) S. pallida present—Wass. – & + after provocative dose, 85 per cent. cures.

(3) S. pallida present—Wass. + & + (stronger) after provocative dose, 70 per cent. cures.

I would like to draw attention to the fact that chancres of the meatus, urethra, and the throat are frequently overlooked, and it is only when secondaries have developed that it is recognised that a chancre has been missed in one or other of these regions.

Since I had the pleasure of taking part in the discussion on treatment of syphilis at the Royal Academy of Medicine in Ireland last March, we have slightly modified the course of treatment in the hospital under my charge, and which I will give in detail presently. I might mention the different preparations we have used, namely :

Salvarsan, kharsivan, arsenobenzol, arsenobillon (and their "neo" and "nova" preparations), galyl, luargol and intramine.

The first four (salvarsan, kharsivan, arsenobenzol and arsenobillon) we are using exclusively, and they give equally good results.

Formerly galyl (arsenic preparation with phosphorus tacked on) was used on occasions, and although it seemed

to clear up symptoms rapidly it evidently was not so efficacious or destructive to the spirochæte as the other drugs, as relapses were frequent.

When used intramuscularly it did not kill spirochætæ. The advantages claimed for it are—that it is easily dissolved and mixed and given by a Record syringe intravenously, and that it is not toxic. It oxidises quickly, and must be used at once after mixing. Although supposed to be non-toxic, cases of reaction with convulsions, albuminuria, and dermatitis have been recorded. I have seen a number of cases treated with luargol (a preparation of arsenic with silver and antimony in combination), but cannot speak as to its lasting effects. It is easily mixed but tends to cause thrombosis. It is claimed that it is useful in later cases of syphilis and syphilis of the nervous system. Intramine and ferrivine, both introduced by McDonagh, have not been much used, at least in the army. I saw eleven cases treated by intramine with no marked improvement ten to fourteen days after the treatment. I have used it in extreme cases of arsenical dermatitis but am not convinced of its benefit. Ferrivine I have not used, but believe it was tried at one Military Hospital and gave rise to alarming symptoms of dyspnœa and shock immediately following the administration.

The routine treatment of syphilis carried out at Spike Island Military Mospital is as follows :—

On admission the following particulars are taken of each case :—

(1) 1st, 2nd, 3rd attack or relapse.
(2) Date and place of last three exposures.
(3) Main point in history.
(4) Condition on admission :—
    (*a*) Condition of penis.
    (*b*) Condition of lymphatics.
    (*c*) Mucous membrane lesions.
    (*d*) Skin lesions.
    (*e*) Reflexes and other signs or symptoms.

A Wassermann is done and a dark ground examination is made on admission, in every case whether clinical signs are positive or not.

Injections.

Day	Intravenous "914" or 606	Intramuscular "914"	Intramuscular Mercurial Cream
1st	0.45	—	M.X.
8th	—	0.45	M.X.
15th	0.45	—	M.X.
22nd	Rest	Rest	M.X.
29th	—	0.45	M.X.
36th	0.6	—	M.X.
43rd	—	0.45	M.X.
50th	0.6	—	M.X.
Total	2.1 grms.	1.35 grms.	80 M.

Total of 914 in full course, 3.45 grms.

From our experience it is advisable to adopt the course of giving one week's rest after three weeks' treatment. As the majority of intolerances show about this time, it is also advisable that daily observations should be made at this stage of treatment.

When the drug used in the above course for the intravenous injections is of the 606 series, the same doses can be given. Wassermann is again done immediately after the last injection. If negative, the patient is discharged from hospital and reports for blood test in two months. If positive, he is given a follow-up course of two injections of 0.6 grm. intravenous of either 914 or 606, or he is discharged to his unit and put on a course of chronic mercurial treatment as follows :—

Hydrarg. cum creta - - 2 gr.
Pulv. ipecac. Co. - - 2 ,,
Ft. pilula.

The pills to be taken as follows :—

One a day for one week.

Two a day for one week.

Three a day for four weeks.

This course to be repeated *twice*, with *one week's* rest before recommencing.

Caution.—If it is noticed that the teeth ache in their sockets or the gums become inflamed, the pills should be stopped for three days before recommencing with *One* a day.

Intravenous injections of the 914 series are all made up to 10 c.c. Aq. Dest., irrespective of the dose of 914 given.

Intravenous injections of the 606 are dissolved and neutralised in the usual manner, but the amount of saline given is in proportion to the amount of drug administered. A dose of 0.3 grm. of 606 is made up to 90 c.cs with normal saline solution :—0.4. grm. equals 120 c.cs or otherwise 30 c.cs for every 0.1 grm. Litmus paper is used to ensure alkalinity. It must always be remembered that the 606 series are acid and must be rendered alkaline before use, while neo or 914 series are not acid and only require dissolving in distilled water. The course full in the 606 series which is always given intravenously and in bulk is commenced with 0.3 grm. dose for the first three injections: 0.4 grm. for the next three injections, and finish up with the dose of 0.5 grm., a total of 2.6 grms. being given in all.

The *intramuscular* injections are as a rule all 0.45 grm. doses of 914, and 7 m. of aq. dest. are used to dissolve each dose; when dissolved each dose is made up to 1 c.c. with mixture of creosote and camphor (creocamph., Burroughs Wellcome & Co.).

Novarsenobillion we have found most satisfactory for intramuscular injections, being easily dissolved in the small quantity of aq. dest. (7 mns.) giving a clear solution, and producing decidedly less pain than the other preparations in use.

Cases of syphilis of the nervous system are treated by

smaller doses and for a longer period. Commence by a fortnight's course of K.I. Hg., and then pass on to 0.1, 0.2 and 0.3 grm. of 606 and one grain of Hg. weekly till you have reached a total of 4/5 grm. of 606. Allow fourteen days' rest between seven injections, and during that period of rest administer K.I. Lumbar puncture is done in all nervous cases, and Wassermann and cell counts are carried out. I have not seen many cases of syphilis of the nervous system in the army. I consider all cases of this condition, no matter how far advanced, should have the benefit of 606 and Hg. treatment. If we do not get a surprising cure we may at least give relief to many of the distressing symptoms accompanying this condition.

The courses at present in use have proved highly satisfactory both clinically and serologically, and beyond an occasional slight reaction no serious side issues have occurred and cases of severe dermatitis have been unknown.

Further, there is no lowering of the vitality of the soldier and as a result of the treatment he is usually able to return to his duty fit and without requiring any period of convalescence; indeed, the treatment acts as a tonic. During the course soldiers are not bed patients but carry on their usual hospital fatigues, and are on ordinary diet except on the day of treatment, when they are on milk. They have 45 minutes physical training daily under a qualified physical instructor, which assists in keeping them fit and hard. I am still much in favour of the intramuscular or deep subcutaneous method of administering salvarsan. It is a simple method, does away with elaborate mixing and neutralising, which is safe only in the hands of an expert, and it does not tend to give rise to reaction. The bacteriological reports are excellent on the immediate destructive effect on the spirochæte and the lasting effect on the Wassermann. Lastly, by its slow and gradual absorption and excretion the effect of the drug is kept up longer.

The objection to this method of administration is local pain, but I find if it is given carefully in small bulk and

the part is well massaged after injection to diffuse the drug, little or no pain is complained of. I consider that this method is well adapted for the dispensary treatment of syphilis. One does not infrequently meet with a case of syphilis which has received many full courses of 606 and mercury but still persists in showing a full positive Wassermann (I am not talking of congenital syphilis), and I do not know that it is fully explained why this should be so. In this connection I might just briefly refer to a discussion which took place recently at Cincinnati on a paper given by Dr. Heidingsfeld. He thought that the present-day tendency was to adopt a too intensive course of arsenic in treating syphilis, and that cases which had received many courses of 606 and still remain positive with persisting clinical manifestations cleared up with six months' absolute rest from treatment and became negative serologically. He adopts the course of giving a full dose of 606 and repeats it in 4 to 6 months as long as is necessary till the Wassermann continues steadily negative.

He based his arguments on the investigations of Noguchi, who asserted that the spirochæte in time increased its resistance to arsenic; in other words, that syphilis in a very short time acquires a tolerance to certain specific remedies, which remains till the patient is given a definitely long rest from further specific treatment. This may explain the class of case that remains positive after many courses of 606, but I feel sure that most of us would not feel safe or content in giving only one dose of 606 every 4 to 6 months. His line of treatment was adopted in this country in the early days of 606 but was not continued as relapses were the usual sequence.

Perhaps, gentlemen, you will allow me to only mention a subject that is occupying the time and thoughts of many interested in the question of venereal disease, especially I would mention the name of Col. Harrison, D.S.O., K.H.P., Military Hospital, Rochester Row, London, who from his faithful work and writings on venereal disease is

justly looked on as an authority. I refer to the "Preventive Treatment of Venereal Disease," and a discussion on treatment is bound to open up the question of prevention. This question is a far-reaching one, and will meet with much opposition until the general public are educated and enlightened on the terrifying results of the disease. It concerns the Civil Authority as well as the Military. "Prevention is better than cure," and forcibly applies to this class of disease. When we know that 70 per cent. of women suffering from serious pelvic disorders, many of whom require mutilating operations, and when we think of the large number of congenital cases, and deaths in early childhood from contamination from venereal disease, I think the time has arrived when active steps must be taken to stay its progress. It is expected that when our gallant and victorious Army comes home that venereal disease, which has been prevalent during the war, will be greatly increased throughout the country. The reason is that during the war women in great numbers have been employed in many kinds of war and other works, consequently they have in many instances been living more or less free or independent lives, and have been removed from their family influences and home life. As a result of this freedom many have contracted venereal disease. These women may be classified as "Amateurs," and distinct from the "Professional" class, who receive payment for their traffic. It is the former class that is in the majority and which is going to attract the returning soldier. In this way the disease will spread even to remote parts where it was possibly unknown, as soldiers of the present Army come from all parts. Col. Harrison has shown from recent statistics taken from various Military Venereal Hospitals that at the present time two-thirds of all cases in these hospitals were infected by women of the "Amateur" class. He has also shown that at home alone approximately 48 per 1,000 of soldiers during the war have been affected by venereal disease, which follows that many women must also have the disease. Add to

this the number of soldiers returning from abroad with the disease, or with the effects of the disease, and it will be easily seen how it is reasonable to expect for the time being at least venereal disease will be on the increase.

As men will be released from military service and no longer under its control, great responsibility will fall on local Health Authorities, Directors of Civil and General Hospitals to devise some scheme of dealing with the disease in its different aspects. I might also add maternity hospitals, which can do a great deal in treating syphilitic pregnant women and new-born children.

With the happenings of the last few weeks there is no time to lose, and if we have not yet agreed in this country that we are justified in adopting preventive measures for venereal disease, we at least must make ample provision and facilities for the treatment of the disease as soon as it has been contracted.

AN ANOMALOUS DISEASE.

THE *Lancet*, Dec. 14, 1918, quotes from a report of Lieutenant-Colonel Saccone published in the *Annali de Medicina Navale* an account of a curious epidemic at Taranto in May and June 1918, which attacked the civil population and the crews of the men-of-war. Ships might have three or four hundred cases on board in a very few days. Luckily the cases usually lasted only two days. The very young and the very old were not attacked. The disease was clinically differentiated from dengue, influenza, and pappataci fever. A *Micrococcus tetragenus* was found in the blood and pural exudate. Ale streptococcus was sometimes present. The disease was characterised by pharyngitis, headache, pain in the back, pyrexia (even 104°), and in severe cases pneumonia, pleurisy, albuminuria, enlargement of the spleen. Endocarditis is mentioned in the *post-mortem* report of ten fatal cases. Gargling the throat is mentioned as a prophylactic, and in treatment acetyl-salicylic acid ("aspirin") is forbidden, as weakening of the heart is specially feared. Relapses did not occur, so some immunity is probably set up.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES

The Australian Army Medical Corps in Egypt. An Illustrated and Detailed Account of the Early Organisation and Work of the Australian Medical Units in Egypt in 1911-1915. By JAMES W. BARRETT, B.E., C.M.G., M.D., M.S., F.R.C.S. (Eng.); Temporary Lieut.-Col. R.A.M.C., and LIEUT. P. E. DEANE, A.A.M.C. London: H. K. Lewis & Co., Ltd. 1918. Demy 8vo. Pp. xiv. + 259.

THIS clearly written account of the work of the Australian Army Medical Corps in Egypt will be read with interest not only by medical men, but also by many amongst the general public. The authors relate the story of the way in which the Corps was gradually built up out of practically nothing, and, in particular, explain the way in which the hospital with which they were identified was gradually expanded to meet recurring emergencies until finally the equipment of 520 beds reached a grand total of over 10,000. Here and there throughout the book one finds evidence that it is to be regarded not merely as an exposition of work done, but also as a defence against criticisms. Some impatience is shown, not unnaturally, at the fault finding which was apparently displayed by persons whom we may assume to have been ill-informed and probably ignorant. Such criticisms we fear are always to be expected and it is well that they should be answered, though to those acquainted with the facts no answer in the present instance was necessary. The present reviewer spent some time in a hospital in Egypt and can testify to the general admiration that was felt for the work of the A.A.M.C. and to the general recognition of the fact that their presence tided over an anxious period at the beginning of the Gallipoli campaign.

In addition to their main theme, the writers devote considerable space to an account of the work of the Red Cross in Egypt, and make the suggestion that in war-time the Red Cross should become a definite part of the military machine, as is the case in Japan. If this suggestion were adopted much overlapping of activities both at home and abroad would doubtless be prevented.

A thoroughly well thought out chapter on the prevention and treatment of venereal disease amongst troops deserves careful study.

The book is beautifully illustrated by a series of photographs, and is, we repeat, well worthy of study, not only for its immediate interest, but also for the various lessons that may be drawn from it for future occasions, if such should arise. T. G. M.

Hughes' Nerves of the Human Body. With Plates. By Chas. R. Whittaker, F.R.C.S. (Ed.), F.R.S.E., &c.; Senior Demonstrator of Anatomy, Surgeons' Hall, Edinburgh; Lecturer on Biology, New School of Medicine, Edinburgh. Second edition, revised and enlarged. Edinburgh: E. & S. Livingstone. 1918. Demy 8vo. Pp. viii + 76.

The great value of this book consists in the brevity and conciseness of the descriptive letterpress, and in the simplicity and clearness of the twelve new blocks which have been made from the plates of the original edition. The work is of most convenient size and will be found a most admirable *aide-memoire* by the busy practitioner and by the medical student alike.

The old nomenclature has been followed in the text, and in adopting this course we hold that Mr. Whittaker has done wisely. Where the anatomical terms differ materially from those of the B. N. A., the latter have been placed within brackets.

While the first ten plates are essentially anatomical, the eleventh and twelfth represent the cutaneous areas of the upper and lower limbs respectively.

An index compiled by Dr. A. Walker, to whom the author expresses his acknowledgment for help in reading the proofs, helps the reader materially in reference to the contents of the work, which are grouped under the headings "cranial nerves," "spinal nerves," and "sympathetic system."

The cost of the book is small—three shillings and sixpence net. It is beautifully printed on glazed paper of the first quality, and is neatly bound in cloth.

A Short Practice of Midwifery for Nurses. By Henry Jellett, M.D. (Univ. Dubl.), F.R.C.P.I., &c.; Master, Rotunda Hospital, &c. Fifth Edition, revised, with 6 Plates and 169 Illustrations in the text. London: J. & A. Churchill. 1918. Pp. 463 + xiii.

The fifth edition of this work follows the example of its predecessors in excellence. It is brought up to date with one exception—namely, the feeding of infants. It is recognised generally that from the third day a three-hour interval is best. Dr. Jellett has kept to the old-fashioned two-hour interval in the first month and two-and-a-half hours during the second month. We are confident that this slip of the pen will be corrected in the next edition. There are several new illustrations, and the text has been revised.

In our opinion this is the most useful and compact of the many handbooks which have been published for nurses.

B. S.

Materia Medica and Therapeutics. An Introduction to the Rational Treatment of Disease. By J. Mitchell Bruce, M.D., and Walter J. Dilling, M.B. Eleventh edition. London: Cassell & Co., Ltd. 1918. Pp. xiii. + 675.

This eleventh edition will be historically interesting, as it is carefully revised to correspond with the war amendments of 1917 and 1918. These amendments are both

entered under each substance and grouped in an Appendix, so reference is easy. Future dispensers will be interested to know how their forerunners in the great war filled their prescriptions without sugar or glycerine.

The peculiar but convenient arrangement of the earlier editions is preserved, the members of the inorganic Materia Medica being grouped in their own classes, whilst the organic are grouped according to the bodily organs upon which they act.

The Medical Annual. A Year Book of Treatment and Practitioners' Index, 1918. 36th Year. Bristol: John Wright & Sons, Limited; London: Simpkin, Marshall, Hamilton, Kent & Co., Limited.

When an Annual has attained its thirty-sixth year of issue it requires very little recommendation from a reviewer. However, we cannot but draw attention to the many excellencies of the present volume, nor can we withhold praise for the careful editing that, amidst the many difficulties in which both editors and publishers worked, provided so valuable a reference book. On turning over the pages the many beautiful and informative illustrations, many of which are exquisitely coloured, arrest attention. At the present time these illustrations, particularly those dealing with military traumata, are valuable from a clinical point of view, and tend to become more so as records of the diabolical methods introduced and adopted by our enemies to destroy life. But they also teach us how quickly our surgical staff devised appliances to lessen the loss inflicted by mutilation. Pathological specimens are also depicted, so that the book has a permanent value, and will be quite as helpful, if not more so, to our successors as it is to us. We have dwelt on the ills incidental to war, which are so well told and so freely illustrated in this volume; and we could draw attention to the more familiar writings which in the piping days of peace made the reputation of this great Annual did space allow of it. All we can find space to say is they are still given with the same clearness and modernness as in the past.

A Text-book for Midwives. By John S. Fairbairn, F.R.C.P. (Lond.), &c.; Obstetric Physician to St. Thomas' Hospital, &c. Second Edition, with 3 Plates and 113 Illustrations, 5 in Colour. London: Henry Frowde and Hodder & Stoughton. 1918. Cr. 8vo. Pp. 350 + xv.

We are surprised to find that this excellent work of Dr. Fairbairn should have required a second edition so soon, for when we reviewed it favourably on its inception four years ago we were sceptical of its success—not because of any want of merit, but because we did not think that a sufficient number of nurses would trouble to purchase a work of such an advanced standard.

The present edition is enlarged by 40 pages, the price is practically doubled, and the number of illustrations is increased by nine. It is brought thoroughly up-to-date, and we feel confident that the success accorded to the first edition is a sure criterion of the success of the present improved text-book. B. S.

Rural Water Supplies and their Purification. By Alexander Cruikshank Houston, M.B., D.Sc. London: John Bale, Sons and Danielsson, Ltd. 1918. Pp. xv + 136.

The author deals very fully with rain-water, and more generally with well-water, springs, rivers, brooks and lake-water. Each chapter is headed by a summary and ended by a few conclusions. A few of the latter may be quoted—"Rain-water can be sterilised with very small doses of lime, and the excess lime (CaO) neutralised by means of sodium phosphate." "Hard well-water is conveniently sterilised and softened by means of lime and sodium bicarbonate.." "Sterilising can be effected by adding three parts of boiling water to one of unboiled water." "There is no question that many rural districts might make far more use of rain-water for domestic purposes than is now the case."

The Bipp Treatment of War Wounds. By RUTHERFORD MORISON. Oxford University Press. 1918.

THIS little book gives a clear and precise account of the use of the bismuth, iodoform, and paraffin paste in war wounds.

The technique is simple, and in many cases the result aimed at is attained—*i.e.*, changing a contaminated wound into an aseptic lesion.

The paste has proved of the greatest use in many different hands, and has now stood the test of time. It has a very definite use in civil surgery as well as in war work. This book should be in the hands of every surgeon who is not familiar with the Bipp method of treating wounds.

NEW PREPARATIONS AND SCIENTIFIC INVENTIONS.

GENASPRIN.

UNDER this sobriquet it is not very difficult to recognise an old friend, "Aspirin." Genasprin is a brand of acetyl-salicylic acid manufactured by the Genatosan Company, Limited, 12 Chenies Street, London, W.C.2. The preparation is guaranteed by the company—the British purchasers of the Sanatogen Company—to possess the highest uniform quality of genuine aspirin. It is in the form of 5-grain tablets and dispensed in labelled bottles, each containing 35 tablets, at a price of two shillings. As a result of a careful analysis *The Lancet* states that the claim is substantiated that this preparation is a particularly pure specimen of acetyl-salicylic acid.

We note with satisfaction that such a bottle bears the legend: "Dose 1 to 3 tablets, *as medically prescribed.*" It cannot be too generally made known to the public that acetyl-salicylic acid or aspirin is a drug by no means free from danger through its abuse. There is too much tendency at the present day on the part of the public to dose themselves apart from medical advice, and the ghastly tragedies which are ventilated in the newspapers almost daily should put people on their guard against taking drugs on their own account or running the risk of forming the perilous "drug habit."

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

President—Sir John Moore, M.D. Dubl., F.R.C.P.I.
General Secretary—J. A. Scott, M.D., F.R.C.S.I.

SECTION OF OBSTETRICS.

President—Alfred Smith, M.B., F.R.C.S.I.
Sectional Secretary—B. Solomons, M.D., F.R.C.P.I.

Friday, November 22, 1918.

The President of the Academy in the Chair.

Tubal Pregnancy.

Dr. Purefoy showed a specimen of tubal pregnancy

The specimen was discussed by Sir William Smyly and Dr. Solomons.

Sarcoma of the Cervix.

Dr. Bethel Solomons showed a specimen of sarcoma of the cervix which he had removed from a woman aged 50. She had been married 26 years, had had 11 children, the youngest of whom was 11 years of age. She complained of a feeling of "womb falling" after the birth of her last child, but the symptoms vanished until 14 days before she consulted him. On examination, it was found that a large mass, about the size of a large grape fruit, filled the vagina. On tracing this up, it was found to have a distinct connection with the posterior lip of the cervix, with which it was incorporated.

The tumour was removed, and as the cervix was hypertrophied it was amputated. A pathological examination by Dr. Wigham showed that the growth was a spindle-celled sar-

coma, with a large amount of hyaline degeneration of the capillaries, forming a kind of cylindroma.

Following this report, Dr. Solomons performed Wertheim's hysterectomy, and the convalescence was without incident. The uterus on examination proved to be normal.

He commented on the silent growth of the tumour, with absence of symptoms, which was typical of these rare cases of primary sarcoma. He thought that a radical hysterectomy should always be done in this class of case.

Dr. Wigham described the pathology of the specimen. He thought that the sarcoma, although malignant, was, if one might call it so, a benign form of sarcoma.

Dr. Purefoy said sarcoma limited to the cervix uteri is rare, and he could recall only one case similar to the one just described. In it a large sloughing mass distended the vagina and vulva, and hysterectomy was performed, but death ensued from sepsis. In very young subjects myxosarcoma is sometimes seen springing from the cervix in the form of numerous small cysts, but its removal is generally followed by recurrence. Notwithstanding the pathologist's opinion, he was inclined to regard Dr. Solomons' case as one of uterine fibroid showing sarcomatous degeneration.

Mesenteric Tumours.

Sir William Smyly showed two tumours of the mesentery removed from a patient in the Adelaide Hospital. The patient had a large cystocele, which protruded through the vulva, and caused much difficulty in emptying the bladder. On examination a tumour was discovered in Douglas's pouch, which was supposed to be ovarian. After performing an anterior colporrhaphy the abdomen was opened and the tumour, which was exceedingly friable, was drawn out of the abdomen, when it was found to be intimately connected with the intestine. A second tumour was discovered higher up in the mesentery. The tumours, which were supposed to be malignant, were removed with about two feet of the ileum and a large piece of mesentery, and the severed gut was restored by a side-to-side anastomosis. The patient made an uneventful recovery.

Captain Speares, who had examined the specimen, said it was impossible to come to a definite conclusion as to the

nature of the main mass of the tumour. The edges were tubercular, but the central portion was so necrotic that it was impossible to diagnosticate the condition.

Abderhalden's Pregnancy Reaction and Beard's Theory of the Alternation of Generations in Vertebrates.

Dr. Crofton read this paper. After describing the nature of tissue digestion of normal foodstuffs and abnormal substances given parenterally, he showed that the substrate —viz., the placenta—with the possible exception of the syncytial layer, could not possibly be considered foreign or disharmonious, and that, therefore, no specific ferment would be found for it in the maternal system. On the other hand, if Beard's theory was correct, the cells of the chorionic villi, &c., belonging to the phorozoon or asexual generation, were foreign or disharmonious, and accordingly a specific ferment would be formed to their protein which could be recognised by a complement fixation test. He criticised Abderhalden's method of detecting the presence of his protective ferments. [This paper was published in full in the number of the Journal for January. See page 10.]

REPAIR OF LARGE PERIPHERAL NERVE GAPS BY NEUROPLASTY.

The conclusions reached by Mackenzie from the study of three cases are : Regeneration and recovery of function are promoted by the use of nerve flaps. Both central and peripheral flaps can be used for such purposes. A peripheral flap, by laying down a nerve path, may promote regeneration over a great gap; in one case quoted regeneration occurred over a gap $10\frac{3}{4}$ inches in length. The approximation of nerves and their repair should be done in all cases with the least possible delay. (This would apply as well to cases which are infected as to clean cases.) The arrest of trophic shock can be promoted by early closure of large gaps by flaps. Unimpaired nerve tissue should always be utilised for the effective repair of damaged nerves. In their repair, nerves can be successfully sequestrated in muscular tissue so as to promote their own regeneration and that of the muscles in which they are embedded. The principle of sequestration can be utilised in proper cases so as to avoid infected zones in wounds and also scars and other obstacles to nerve repair.

Vital Statistics.

For four weeks ending Saturday, December 28. 1918.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, December 28, 1918, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 18.9 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,127,268. The deaths from all causes registered in the week ended Saturday, December 28, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population :— Nineteen Town Districts, 18.9 and 24.1 ; Dublin Registration Area, 20.4 and 21.0 ; Dublin City, 21.7 and 22.4 ; Belfast, 19.4 and 26.2 ; Cork, 18.4 and 21.3 ; Londonderry, 9.1 and 25.7 ; Limerick, 17.6 and 26.4 ; and Waterford, 20.9 and 18.1.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, December 28, 1918, were equal to an annual rate of 0.4 per 1,000. Among the 146 deaths from all causes in Belfast were 1 from diphtheria and 2 from diarrhœa and enteritis in children under 2 years One of the 8 deaths from all causes in Ballymena was from scarlet fever.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock and Kingstown. The population of the area is taken as 399,000.

In the Dublin Registration Area the births registered during the week ended December 28, 1918, amounted to 105—53 boys and 52 girls, and the deaths to 162—82 males and 80 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 6) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of

20.4 per 1,000 of the population. The rate for all deaths registered during the fifty-two weeks of 1918 ended December 28 was 25.6, while in the corresponding period of the preceding ten years, 1908–1917, it had been 22.0.

The 156 deaths appertaining to the Area included 1 from measles and 4 from diarrhœa and enteritis of children under 2 years. Nine deaths from influenza were registered. Of these deaths 4 belonged to the City, of which 1 was assigned to North City Districts and 3 were assigned to South City Districts. Five deaths from influenza (or 3.3 per 1,000 of the population) were referred to the Urban Districts of Rathmines, Pembroke, Blackrock and Kingstown. In the three preceding weeks deaths from influenza in the Registration Area had numbered 42, 24, and 14 respectively.

Deaths attributed to pneumonia were 24 (comprising 13 from broncho-pneumonia, 4 from lobar pneumonia, and 7 from pneumonia, type not distinguished), as against 24, 20, and 18 in the three weeks preceding.

Tuberculosis caused 22 deaths as against 19, 22, and 13, respectively, in the three weeks preceding. Of the 22 deaths ascribed to tuberculosis, 17 were referred to pulmonary tuberculosis, 2 to tubercular meningitis, and 3 to other forms of tuberculosis.

Six deaths were caused by cancer, 9 by organic diseases of the heart, and 17 by bronchitis.

Among the deaths of infants under one year old, 4 were ascribed to convulsions, 5 to broncho-pneumonia, 4 to diarrhœa and enteritis, 2 to premature birth, 1 to congenital malformation, and 6 to congenital debility.

Forty-one of the deaths registered during the week appertaining to the Area were of children under 5 years of age, 28 being of infants under one year, of whom 10 were under one month old. Thirty-four deaths of persons aged 65 and upwards were registered, including 30 deaths of persons of 70 years or upwards.

Of the 156 recorded deaths 62 occurred in hospitals and other public institutions.

There were 7 violent deaths, 4 having been caused by burns, 3 of the victims being children under 5 years of age.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended

December 28, and the cases under treatment at its close respectively, were as follow:—Enteric fever, 1 and 11, measles, 0 and 3; scarlet fever, 7 and 52 (exclusive of 23 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 1 and 4. Eight cases of pneumonia were admitted during the week, and 78 remained under treatment at its close. Of the deaths in hospital recorded during the week, 5 were from pneumonia.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, December 28, in 96 large English towns (including London, in which the rate was 16.0) was equal to an average annual death-rate of 16.8 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 14.8 per 1,000, the rate for Glasgow being 14.0, and that for Edinburgh 12.7

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20 N., Long. 6° 15′ W., for the Month of December, 1918.

Mean Height of Barometer,	29.722 inches,
Maximal Height of Barometer (14th, at 9 p.m.),	30.263 ,,
Minimal Height of Barometer (19th, at 9 a.m.),	29.070 ,,
Mean Dry-bulb Temperature,	45.3°.
Mean Wet-bulb Temperature,	43.5 .
Mean Dew-point Temperature,	41.5 .
Mean Elastic Force (Tension) of Aqueous Vapour,	26.1 inch.
Mean Humidity	86.5 per cent.
Highest Temperature in Shade (on 4th),	60.0 .
Lowest Temperature in Shade (on 25th),	31.8 .
Lowest Temperature on Grass (Radiation) (26th)	27.8 .
Mean Amount of Cloud,	59.2 per cent.
Rainfall (on 23 days),	2.530 inches.
Greatest Daily Rainfall (on 15th),	0.578 inch.
General Directions of Wind,	W.S.W., S.W., W.

Remarks.

December, 1918, proved to be a very open month of south-westerly and westerly winds, much cloud (59 per cent.), and frequent rain. The mean temperature was 4.3 above the average and 1.3 above that of November. No snow, sleet, or

hail fell in Dublin. A feature of the month was the frequency of lightning in connection with the large and deep atmospheric depressions which swept in over the British Isles from the Atlantic. In Dublin sheet lightning was seen on the nights of the 1st, 11th, 19th and 31st. Lunar halos appeared on the evenings of the 10th, 14th and 16th. Aurora borealis occurred on the night of the 23rd. A calm, cold period prevailed at Christmas—Christmas Eve and Christmas Day being the coldest days of the month.

The mean temperature of the first week, ended the 7th, was 53.4°—that is, 10.2° above the average. During the second week constant S.W. winds prevailed, with a continuance of exceptionally mild weather, the mean temperature being 49.5°. In the third week (15th—21st) atmospheric pressure remained unstable, but successive depressions took a more easterly course than previously, and temperature fell away, the mean declining to 41.1°. The fourth week (22nd–28th) was characterised by a very unsteady barometer, with a range from 29.259 inches at 9 p.m. of the 22nd to 30.203 inches at 9 p.m. of Christmas Day. Notwithstanding the cold Yuletide spell already mentioned the mean temperature of this fourth week was 43.3°—an advance of 2.2° on its predecessor. The weather remained changeable and broken to the close.

In Dublin the arithmetical mean temperature (46.3°) was much above the average (42.0°); the mean dry-bulb readings at 9 a.m. and 9 p.m. were 45.3°. In the fifty years ending with 1915, December was coldest in 1878 (M.T. = 32.8°), and in 1874 (M.T. = 36.8°); warmest in 1898 (M.T. = 47.6°) and in 1900 and 1905 (M.T. = 47.1°). In December, 1917, the M.T. was 40.6°.

The mean height of the barometer was 29.722 inches, or 0.153 inch below the corrected average value for December—namely, 29.875 inches. The mercury rose to 30.263 inches at 9 p.m. of the 14th, and fell to 29.070 inches at 9 a.m. of the 19th. The observed range of atmospheric pressure was, therefore, 1.193 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 45.3°, or 1.2° above the value for November, 1918. Using the formula *Mean Temp.* = *Min.* + (*Max.* − *Min.*) × .52, the value was 46.5°, or 4.4° above the average mean temperature for December, calculated in the same way, in the thirty-five years, 1871–1905,

inclusive (42.1°). The arithmetical mean of the maximal and minimal readings was 46.3°, compared with a thirty-five years' average of 42.0°. On the 4th the thermometer in the screen rose to 60.0°—wind, S.S.W.; on the 25th the temperature fell to 31.8°—wind, W. The minimum on the grass was 27.8° on the 26th. Frost in the screen occurred on only 2 nights, and only 7 nights of frost on the grass were recorded.

The rainfall was 2.530 inches, distributed over 23 days. The average rainfall for December in the thirty-five years, 1871–1905, was 2.250 inches, and the average number of rain-days was 17. The rainfall, therefore, was above, and the rain-days were considerably above, the average. In 1876 the rainfall in December was very large—7.566 inches on 22 days. In 1868 (which was otherwise a fine and dry year), 4.749 inches fell on as many as 27 days. In 1915, also, 4.877 inches fell on 25 days in December. On the other hand, in 1867, only 0.771 inch was measured on 13 days; in 1885, only 0.742 inch on 10 days; in 1892, only 0.795 inch on 10 days; and in 1871, only 0.797 inch on 15 days. In 1917, the rainfall was 2.255 inches on 17 days.

High winds were noted on 10 days, but never attained the force of a gale at 9 a.m. or 9 p.m. No vapour fogs were observed in Dublin. There was, as in November, a complete absence of snow, sleet, or hail. Lunar halos were seen on the 10th, 14th, and 16th. Lightning occurred on the nights of the 1st, 11th, 19th, and 31st. Aurora was seen on the night of the 23rd.

The rainfall in Dublin during 1918 amounted to 26.798 inches on 202 days, compared with 38.605 inches on 233 days in 1916, only 16.601 inches on 160 days in 1887, and a thirty-five years' (1871–1905) average of 28.000 inches on 198 days. In 1917, the rainfall was 29.034 inches on 200 days.

Mr. C. M. Connolly reports that at the Normal Climatological Station at Trinity College, Dublin, the mean height of the barometer was 29.745 inches, the range of atmospheric pressure being from 30.254 inches at 9 a.m. of the 19th to 29.082 inches at 9 p.m. of the 14th. The mean value of the readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 46.6°. The arithmetical mean of the daily maximal and minimal temperatures was 46.6°. The screened thermometers rose to 62° on the 4th, and fell to 30° on the 26th.

On the latter day the grass minimum was 20°. Rain fell on 22 days to the amount of 2.394 inches, the greatest fall in 24 hours being 0.465 inch on the 15th. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 32.0 hours, of which 3.3 hours occurred on the 10th. The mean daily sunshine was 1.0 hour. The mean temperature of the soil at 9 a.m. at a depth of one foot was 45.6°; at a depth of 4 feet it was 47.6°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data :—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin ; Mr. T. Bateman, Malahide, Co. Dublin ; Mr. J. Pilkington, Stirling, Clonee, Co. Meath ; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin ; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin ; Mr. F. Dudley Joynt, Donnybrook, Dublin ; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin ; Dr. Arthur S. Goff, Dundrum, Co. Dublin ; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin ; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow ; Mrs. Sydney O'Sullivan, Auburn, Greystones ; Dr. F. O'B. Kennedy, Royal National Hospital, Newcastle, Co. Wicklow ; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare ; Mrs. E. Davis, Castleconnell, Co. Limerick ; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 3.30 inches, on 25 days. Average, 3.10 inches on 20 days. Maximum in 24 hours, 0.44 inch on 15th. Rainfall since January 1, 31.12 inches on 200 days. Average, 29.69 inches on 195 days. Maximal temperature in shade, 57.1° on 13th ; minimum, 30.8° on 25th.

Malahide.—[No return.]

Clonee.—Rainfall, 4.08 inches, on 24 days. Maximum, 0.64 inch on 15th. Rainfall since January 1, 33.93 inches, on 205 days.

Phœnix Park.—Rainfall, 3.00 inches, on 24 days. Maximum, 0.625 inch on 15th. Total amount of sunshine was 66.2 hours, the most being 6.4 hours on 31st.

Cheeverstown.—Rainfall, 1.37 inches, on 11 days to the 15th. Maximum, 0.86 inch, on 15th. [Return incomplete.]

Donnybrook.—Rainfall, 2.390 inches, on 22 days. Maximum, 0.613 inch on 15th. Total for year, 23.770 inches on 180 days.

Ranelagh—

Mean corrected Height of Barometer,	29.727 inches.
Highest corrected Reading (25th, 21 hrs.),	30.18 ,,
Lowest corrected Reading (18th, 21 hrs.),	29.18 ,,
Mean Dry Bulb Temperature,	45.7°.
Mean Wet-bulb Temperature,	44.1°.
Mean Vapour Pressure,	0.275 inch.
Mean Humidity,	89 per cent.
Mean Maximal Temperature,	50.7°.
Mean Minimal Temperature,	41.8°.
Arithmetical Mean Temperature,	46.3°.
Highest Temperature in Screen (4th),	61°.
Lowest Temperature in Screen (31st),	30°.
Lowest Temperature on Grass (26th),	21°.
Nights of Ground Frost,	10.
Rainfall (on 21 days),	2.45 inches.
Greatest Daily Rainfall (15th),	0.56 inch.
Mean Amount of Cloud,	71.5 per cent.
Days of Clear Sky,	1.
Days of Overcast Sky,	16.
General Directions of Wind,	S.W. to W.

Remarks.—The first two weeks were exceptionally mild. Generally the month was cloudy, windy, and damp. During 1918 24.33 inches of rain fell on 190 days, compared with 28.07 inches on 186 days in 1917. The mean temperature for the year was 50.4°, compared with 48.7° in 1917. Temperature in the screen (during 1918) rose to 78° on August 20th, and fell to 22° on January 8th.—H. Fayle.

Dundrum.—Rainfall, 3.25 inches, on 26 days. Maximum 0.63 inch on 15th. Mean shade temperature, 47.9°; maximum, 65° on 13th; minimum, 31° on 25th.

Killiney.—Rainfall, 2.65 inches on 17 days. Maximum, 0.70 inch on 15th. Average (24 years), 2.342 inches on 176 days.

Greystones (Rathdown House).—Rainfall, 4.30 inches on 20 days. Maximum, 0.73 inch on 15th.

Greystones (Auburn).—Rainfall, 3.57 inches on 21 days. Maximum, 0.52 inch on 15th.

NEWCASTLE.—Rainfall, 4.54 inches on 23 days. Maximum, 0.75 inch on 21st. Mean temperature, 44.0°; maximum, 58° on 3rd; minimum, 30° on 24th; mean maximum, 49.2°; mean minimum, 38.7°.

ENNISTYMON.—Rainfall, 8.21 inches on 30 days. Maximum, 1.28 inches on 21st. The year's rainfall was 54.71 inches on 237 days.

CASTLECONNELL.—Rainfall, 7.07 inches on 26 days. Maximum, 0.74 inch on 28th. The year's rainfall was 50.88 inches on 216 days.

DUNMANWAY.—Rainfall, 12.41 inches on 30 days. Maximum, 1.14 inches on 7th. The observer writes:—A very wet, mild month. Frost on nights of the 16th, 19th, 22nd, 23rd and 24th. Christmas Day was a beautiful, fine, bright day, St. Stephen's Day was wet and misty all day. The total rainfall for 1918 was 69.47 inches on 237 days. Wettest year (since I began observing in Sept., 1904) in spite of a very dry spring and summer. Only 18.83 inches fell from March 1st to August 31st.

RAINFALL IN 1918.

At 40 Fitzwilliam Square, West, Dublin.

Rain Gauge:—Diameter of Funnel, 8 in. Height of top—Above ground: 1 ft. 4 in.; above sea level, 54 ft.

Month	Total Depth	Greatest Fall in 24 Hours		Number of Days on which .01 or more was recorded
	Inches	Inches	Date	
January,	1.600	0.350	18th	15
February,	1.900	0.288	17th	21
March,	1.032	0.181	27th	13
April,	1.871	0.489	9th	11
May,	2.273	0.420	3rd	10
June,	0.910	0.185	9th	13
July,	2.758	0.472	12th	18
August,	2.186	0.602	25th	17
September,	4.867	1.261	15th	26
October,	2.356	0.408	3rd	21
November,	2.515	1.196	1st	14
December,	2.530	0.578	15th	23
Total	26.798	1.261	Sept. 15th	202

The rainfall was 26.798 inches, or 1.202 inches under the average annual measurement of the thirty-five years, 1871–1905, inclusive—viz., 28.000 inches.

It is to be remembered that the rainfall in 1887 was very exceptionally small—16.601 inches. In 1870 only 20.859 inches fell; in 1884 the measurement was 20.467 inches; in 1883 it was 20.493 inches.

The scanty rainfall in 1887 was in marked contrast to the abundant downpour in 1886, when 32.966 inches—or as nearly as possible double the fall of 1887—fell on 220 days. In 1900 the rainfall was 34.338 inches, or 6.338 inches in excess of the average for the thirty-five years, 1871–1905. In 1910, also, the rainfall was very large, 35.439 inches on 219 days. Only twice since these records commenced has the rainfall in Dublin exceeded that of 1910—namely, in 1872, when 35.566 inches fell on 238 days, and in 1916 when no less than 38.605 inches fell on 233 days. In 1880 34.512 inches were measured on, however, only 188 days. In 1915 33.522 inches of rain fell on 204 days. The year 1916 established a notable record for rainfall in Dublin, the fall having been 10.605 inches above the average.

In 1918 there were 202 "rain-days," or days upon which not less than .005 inch of rain (five-thousandths of an inch) was measured. This was 4 days in excess of the average number of rain-days in the thirty-five years, 1871–1905, inclusive. In 1868 and 1887—the warm, dry years of recent times—the rain-days were only 160, and in 1870 they were only 145.

On two occasions in 1918 one inch of rain or upwards fell on a given day in Dublin—viz., September 15th, 1.261 inches, and November 1st, 1.196 inches. In 1901, the rainfall only once exceeded one inch, but on that occasion (November 11th) the measurement was 2.037 inches. In 1902, 1.342 inches fell on July 25th and 2.075 inches on September 2nd. An excessive rainfall on August 25th, 1905, is especially noteworthy—it amounted to 3.436 inches in Dublin (Fitzwilliam Square). On no other occasion within the previous 47 years had 3 inches or upwards been measured. It was the ninth occasion only since 1865—that is, in 47 years inclusive—upon which 2 inches had been measured in Dublin at 9 a.m. as the product of the

preceding 24 hours' precipitation. The previous excessive falls were—August 13th, 1874 (2.482 inches) ; October 27th, 1880 (2.736 inches) ; May 28th, 1892 (2.056 inches) ; July 24th, 1896 (2.020 inches) ; August 5th, 1899 (2.227 inches) ; August 2nd, 1900 (2.135 inches) ; November 11th, 1901 (2.037 inches) ; and September 2nd, 1902 (2.075 inches).

The rainfall in the first six months of 1918 was 9.586 inches on 83 days. In the second six months it was 17.212 inches on 119 days.

The rainfall was distributed quarterly as follows :—4.532 inches fell on 49 days in the first quarter, 5.054 inches on 34 days in the second, 9.811 inches on 61 days in the third, 7.401 inches on 58 days in the fourth quarter.

Included in the 202 rain-days in 1918 are only 8 on which snow or sleet fell, and 17 on which there was hail. In January hail was observed on 1 day, in February on 1 day, in March on 4 days, in April on 3 days, in June on 1 day, in July on 3 days, in September on 3 days, and in October on 1 day. Snow or sleet fell on 4 days in January, 1 day in February, 1 day in March, and 2 days in April. Thunderstorms occurred on 3 days in July. Thunder was heard without visible lightning once in February and May, twice in July, and twice in August. Sheet lightning was seen once in March, May, August, September, and November, and 4 times in December.

More or less fog prevailed on 11 occasions—3 in January, 1 in February, 1 in April, 2 in May, 1 in July, 2 in October, and 1 in November. High winds amounted to gales (force 8 or upwards, according to the Beaufort scale) on 12 occasions—5 in February, 1 in June, 3 in October, and 3 in November.

Solar halos were seen on 13 days, a lunar halo on 8 nights, a lunar corona on 6 nights. Aurora borealis was seen on the evenings of August 4th and of December 23rd.

The striking features of the weather of 1918 were : (1) A very mild, frostless February of southerly and south-westerly winds ; (2) a cold April, with persistent N.E. and E. winds ; (3) a very unsettled, cold, and wet September ; (4) a very mild and open December, which was actually warmer than November by 1.3° ; and (5) a complete absence of hail, snow or sleet in the late autumn or early winter.

Abstract of Meteorological Observations taken at Dublin (40 Fitzwilliam Square, West) during the Year 1918.

MONTH	Abs. Max.	Date	Abs. Min.	Date	Mean Daily Max.	Mean Daily Min.	Rainfall	Rain Days	Mean Height of Barometer	Highest Pressure	Date	Lowest Pressure	Date	Prevalent Winds
	°		°		°	°	"		"	"		"		
January -	56.8	28th	24.1	8th	16.3	38.1	1.600	15	29.870	30.620	3rd	28.825	20th	W., S.S.W.
February -	55.4	7th & 12th	31.7	28th	51.4	43.5	1.900	21	30.020	30.784	25th	29.521	9th	S., S.W., W.S.W.
March - -	64.0	23rd	30.0	2nd	50.7	39.9	1.032	13	30.012	30.428	13th	28.962	31st	S.W., E.
April - -	62.0	27th	32.0	15th	51.8	40.0	1.871	11	30.015	30.344	28th	29.410	1st	N.E., E.N.E., E.
May - -	71.9	21st	42.8	5th	61.6	48.2	2.273	10	30.035	30.533	28th	29.426	13th	E., N., W.
June - -	73.2	2nd	41.9	16th	63.9	50.3	0.910	13	30.113	30.545	1st	29.405	18th	W.N.W., W., N.W.
July - -	72.2	22nd	45.7	10th	66.2	52.4	2.758	18	29.880	30.527	3rd	29.447	22nd	W., S.W.
August - -	75.7	20th	47.1	29th	67.2	55.2	2.186	17	29.981	30.317	13th, 29th	29.483	5th	W., W.S.W., W.N.W.
September -	66.1	16th	38.0	30th	58.1	47.4	4.867	26	29.669	30.225	30th	28.989	22nd	W., S.W., W.N.W.
October - -	62.9	9th	34.1	24th	54.5	44.1	2.356	21	29.936	30.400	20th	29.406	7th	W., S.W.
November -	56.3	4th	27.5	19th	50.1	40.3	2.515	11	29.946	30.453	13th	28.730	2nd	W., W.S.W.
December -	60.0	4th	31.8	25th	50.5	42.1	2.530	23	29.722	30.263	14th	29.070	19th	W.S.W., S.W., W.
Extremes, Totals, and Means	° 75.7	Aug. 20th	° 24.1	Jan. 8th	° 56.0	° 45.1	" 26.798	Days 202	" 29.933	" 30.784	Feb. 25th	" 28.730	Nov. 2nd	W., S.W.
					50.6°									

January 4, 1919.

JOHN WILLIAM MOORE, M.A., M.D., D.P.H., Dubl.; D.Sc. Oxon.; F.R.C.P.I. F. R. Met. Soc.

PARALYSIS AGITANS AND THE CORPUS STRIATUM.

It appears that we are within a measurable distance of an understanding of the pathology of this chronic nervous syndrome. In an interesting paper by Dr. J. Ramsay Hunt in the *Archives of Internal Medicine* (November, 1918) this writer records in full detail the morbid findings in two cases of paralysis agitans ; in both the sole lesion was found to be a primary atrophy of the pallidal system of the corpus striatum. The corpus striatum in man is divided by the passage of the internal capsule into two structures, the caudate nucleus and the lenticular nucleus. The latter is subdivided into an external segment, the putamen, and an internal, the globus pallidus. The globus pallidus is older phylogenetically than the caudate nucleus and putamen (neostriatum). It is also distinguished from these structures histologically. The neostriatum contains two types of cells, a small type of ganglion cell of pyramidal form, and a large type of ganglion cell, the homologues in the corpus striatum of the Betz cells in the motor cortex ; the globus pallidus contains only these latter large cell types. By the course of the fibres related to these two cell systems their functional significance can be inferred. The small-cell fibres end in the globus pallidus ; they constitute a short association and inhibitory system for the corpus striatum, and atrophy of this system is the essential cause of Huntington's chorea (Hunt). The large-cell fibres, on the other hand, have a wider distribution ; they extend to the optic thalamus, constituting the efferent pallidal system, and exert, through the red nucleus and substantia nigra, a regulating influence upon the extra-pyramidal motor system of the spinal cord. Lesion of this pallidal system results in paralysis agitans. The corpus striatum and the strio-spinal system are to be regarded as constituting a mechanism for the control and regulation of automatic and associated movements, paralysis of which results in the syndrome of paralysis agitans ; in this sense it is to be distinguished from the other type of central palsy characterised by spastic paralysis, a paralysis here of isolated and discriminatory movements, and referable to damage of the pyramidal system.

The two cases recorded confirm these views as to the pathology of paralysis agitans. In the first, that of a man aged 56, who died of an intercurrent infection, there were found atrophic changes in the large motor cells of the neostriatum, with slight reduction of the medullary network of the globus pallidus and thinning of the strio-hypothalamic radiation. The second case showed atrophic changes in the large motor cells of the corpus striatum and other changes in the globus pallidus similar to those met with in the first case. There were no other evidences of central nervous involvement in either case Dr. Hunt discusses the causation of the symptomatology. The rigidity and tremor are referred to a loss of striatal inhibition, the corpus striatum controlling muscle tonus as does the cerebral cortex. When this inhibitory function is abolished hypertonicity results. The striated muscle has a double innervation—the anisotropic disc system controlled by the motor nerves, and the sarcoplasmic substance controlled by the sympathetic system. The former subserves the function of quick contraction ; the latter, plastic function concerned in posture. It is suggested that there exist two distinct centres for the control of muscle tonus—one for contractile tonus, which regulates the anisotropic disc system, the other for the plastic tonus. Both centres are under the control of the pallidal system, and loss of this control may be indicated by tremor or rigidity according to the system involved.—*Lancet*, Jan. 11, 1919.

[In *The Medical Clinics of Chicago* for March, 1917 (Volume 2, Number 5), published by W. B. Saunders Company, Philadelphia and London, will be found an important clinical lecture on Paralysis Agitans by Dr. Ralph C. Hamill, of the North Western University Medical School. That lecture is dated October 20, 1916, and is illustrated by a demonstration of three cases of the disease. The author says :—"Paralysis agitans is a collection of symptoms evidently due to disease in the lenticular nucleus, in many cases showing this glia-formation. Ramsay Hunt, at the last Congress of Neurologists, exhibited some very good photographs showing undoubted changes in the lenticular nucleus."—Editor *D. J. M. S.*]

THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

MARCH 1, 1919.

PART I.

ORIGINAL COMMUNICATIONS.

ART. VII.—*Half-a-Century's Review of Marriages and Births in Ireland.*[a] 1866 to 1915. By SIR WILLIAM J. THOMPSON, M.D. Dubl., F.R.C.P.I., Registrar-General for Ireland.

IN this retrospect of the marriages and births recorded in Ireland, England and Wales and Scotland during the fifty years ending with the year 1915, I have endeavoured to present the facts—as shown in the Tables—in as concise a manner as possible, and with this object in view actual numbers are, generally speaking, omitted, and only the proportions to the populations are given. Moreover, the information is condensed into ten quinquennial periods, and diagrams will be used to show the variations throughout the fifty years. The figures given are derived from the Annual Reports of the Registrars'-General for Ireland, England and Wales, and Scotland, and from the Census Reports of the respective countries.

Marriages.

During the half century under review, 1,172,453 marriages were registered in Ireland, being equivalent to an average annual rate of 4.9 per 1,000 of the population; in

[a] Presidential Address to the Section of State Medicine in the Royal Academy of Medicine in Ireland, delivered on Friday, January 17, 1919.

the same period 11,445,754 marriages were registered in England and Wales, affording an average annual rate of 7.9 per 1,000, and in Scotland there were registered 1,413,335 marriages, the corresponding rate being 7.0 per 1,000.

In the following statement the rates for each country are given.

TABLE A.—*Showing the number of Marriages per* 1,000 *of the Population in Ireland, as compared with England and Wales, and Scotland, during each Quinquennial Period from* 1866 *to* 1915.

Quinquennial Period	Rate per 1,000 of the Population		
	Ireland	England and Wales	Scotland
1866–1870	5.3	8.2	7.0
1871–1875	4.9	8.6	7.5
1876–1880	4.5	7.7	6.9
1881–1885	4.3	7.6	6.9
1886–1890	4.3	7.4	6.5
1891–1895	4.8	7.6	6.8
1896–1900	5.0	8.1	7.3
1901–1905	5.2	7.8	7.0
1906–1910	5.1	7.7	6.8
1911–1915	5.3	8.2	7.1

From this Table it will be observed that the marriage rates for Ireland and England and Wales, viz., 5.3 and 8.2, respectively, in the first five-yearly period are identical with those for the last, while the rate for Scotland (7.0) for 1866-70 differs but slightly from the rate (7.1) for 1911-15. Indeed it might be said the curve for Ireland, if put in a diagrammatic form, is almost identical with that for each of the other countries. Generally speaking, the foregoing Table discloses the fact that there is a steady fall from the first to the fifth quinquennial period, followed by a steady rise up to the last quinquennial period, varied, however, by a slight decrease in 1906-1910 as compared with 1901-5. The increase in the marriage rate for the period, 1911-15, is to some extent due to the "War Marriages" registered in 1915.

Viewing the figures in the preceding statement, it will

not come as a surprise to learn from the Census Reports of 1911 that of the total number of women in Ireland between 15 and 45 years, only 34.4 in every hundred were married, the corresponding percentage for England and Wales being 47.7, and that for Scotland 42.6.

I mention the age 15 to 45 years, as that is the age period usually associated with maternity, and as the age at which women marry is important from many points of view, the following Table has been compiled in order to show the variations in the ages of married women in Ireland, England and Wales, and Scotland according to the Census Returns from 1871 to 1911.

Table B.—*Showing for Ireland, England and Wales, and Scotland, the proportion per cent. of Wives* 15-20, 20-25, 25-35 *and* 35-45 *years, according to the Census from* 1871 *to* 1911.

IRELAND.

Census Year	Proportion per cent. of Wives Aged				Total, 15–45 Years
	15–20	20–25	25–35	35–45	
1871	1.1	11.0	46.7	41.2	100.
1881	0.8	10.0	42.2	47.0	100.
1891	0.7	9.3	42.4	47.6	100.
1901	0.5	8.9	44.9	45.7	100.
1911	0.4	7.3	43.1	49.2	100.
ENGLAND AND WALES.					
1871	1.3	13.9	45.5	39.3	100.
1881	1.1	13.7	45.6	39.6	100.
1891	0.9	12.8	46.0	40.3	100.
1901	0.7	11.8	46.8	40.7	100.
1911	0.5	9.4	46.0	44.1	100.
SCOTLAND.					
1871	1.1	12.0	46.2	40.7	100.
1881	0.9	12.5	45.5	41.1	100.
1891	0.7	11.4	46.0	41.9	100.
1901	0.8	11.5	46.1	41.6	100.
1911	0.7	9.6	45.0	44.7	100.

The principal feature of this Table is the evidence it affords of the postponement of marriage by the women of

the three countries, and while the proportions of married women at each age period for England and Wales and Scotland show rather close similarity, especially in the later years, the average age at marriage of the wives in Ireland is appreciably higher than is the case in England or Scotland.

Of the married women in Ireland, according to the Census of 1911, at ages 15-45 years, 7.3 per cent. were 20-25 years, in England and Wales 9.4 per cent. and in Scotland 9.6. In Ireland 43.1 per cent. were between 25 and 35 years, in England and Wales 46.0 per cent. were so circumstanced, and in Scotland 45.0 per cent. The age-period, 35-45 years, contributed 49.2 per cent. of the total for Ireland, the percentage for England being 44.1, and for Scotland 44.7. Married women, in 1911, aged 15 and under 20 years, exhibit only a small proportion of those under 45 years of age, being 0.4 per cent. for Ireland, 0.5 for England and Wales, and 0.7 for Scotland.

Births.

It is probable that in the earlier years shown in the following Table, registration was not so complete as it might have been, owing to the registration in Ireland not having been long in existence, but how far defections occurred it is not possible to say definitely. Caution must therefore be exercised with reference to the use of figures for the earlier years.

There were registered in Ireland during the fifty years 5,860,422 births, being equivalent to an average annual rate of 24.3 per 1,000 of the average estimated population of these years; in the same period the births recorded for England and Wales numbered 41,137,102, affording a rate of 30.3 per 1,000 of the average population, and in Scotland the number of births amounted to 6,246,457, or 30.8 per 1,000 of the population, arrived at in a similar way. The facts for these countries for each of ten quinquenniums are given in the following Table.

Table C.—*Showing the number of Births per* 1,000 *of the Population in Ireland, as compared with England and Wales, and Scotland, during each Quinquennial Period from* 1866 *to* 1915.

Quinquennial Period	Rate per 1,000 of the Population		
	Ireland	England and Wales	Scotland
1866–1870	26.8	35.3	34.9
1871–1875	27.1	35.5	35.0
1876–1880	25.5	35.3	34.7
1881–1885	23.9	33.5	33.3
1886–1890	22.8	31.4	31.5
1891–1895	23.0	30.5	30.5
1896–1900	23.3	29.3	30.0
1901–1905	23.2	28.2	29.2
1906–1910	23.3	26.3	27.6
1911–1915	22.7	23.6	25.4

It will be seen from this Table that the highest rate recorded for the three countries was in the period 1871-5, during which Ireland shows an average annual rate of 27.1, England and Wales 35.5, and Scotland 35.0. In 1911-15 the respective birth-rates were 22.7, 23.6, and 25.4. Thus the fall in the crude birth-rate for England and Wales in the last quinquennial period as compared with the second amounted to 11.9 per 1,000 of the population, or 33.5 per cent.; in Scotland it was 9.6 per 1,000, or 27.4 per cent., while in Ireland the reduction was only 4.4 per 1,000, or 16.2 per cent. It will be observed that the fall in Ireland is subject to some fluctuations. The curve for Ireland follows those for England and Wales and Scotland up to the period 1886-90, the similarity of the fall for the three countries from the period 1876-1880 being very marked, but from the point (1886-1890), while the other countries continue their downward course, the curve for Ireland shows a slight tendency upwards.

The fall in the birth-rate in England and Wales and Scotland is due largely to the decreased fertility of married women. Reduction in illegitimacy and postponement of marriage (see Table B) also contribute to the fall. In

Ireland the reduction in the birth-rate was due almost entirely to the decrease in the married women of maternity ages (15-45 years) in the population, increased age at marriage being also a factor.

This aspect of the question will be discussed under the heading " Fertility of Marriages."

Illegitimate Births.

In arriving at the illegitimate birth-rate two methods are usually employed: one is based on the total births registered; the other, on the number of unmarried women and widows of age 15 and under 45 years of age in the population.

The latter method gives the more accurate results, because one of the numbers employed in the calculation, viz., the number of the unmarried and widowed is a constant, whereas in the first-named method both the total births and the illegitimates are variables. The following statement shows the results of the calculation on the total births.

TABLE D.—*Showing the number of Illegitimate Births per* 1,000 *of all Births registered in Ireland, as compared with England and Wales, and Scotland, during each Quinquennial Period from* 1866 *to* 1915.

Quinquennial Period	Illegitimate Births per 1,000 Births Registered		
	Ireland	England and Wales	Scotland
1866–1870	31	58	99
1871–1875	25	52	91
1876–1880	24	48	85
1881–1885	27	48	83
1886–1890	28	46	80
1891–1895	27	42	74
1896–1900	26	41	68
1901–1905	26	39	65
1906–1910	26	40	71
1911–1915	29	43	72

The above Table shows somewhat different results from those shown in the following Table, although the respective

curves, in so far as they are comparable, follow the same general direction.

Table E.—*Showing the number of Illegitimate Births per* 1,000 *of Unmarried and Widowed Women between the ages of* 15 *and* 45 *years in Ireland, as compared with England and Wales, and Scotland, during the periods* 1870-1872, 1880-1882, 1890-1892, 1900-1902 *and* 1910-1912.

Period	Illegitimate Births per 1,000 Unmarried and Widowed Women 15–45 Years		
	Ireland	England and Wales	Scotland
1870–1872	5.6	16.9	24.5
1880–1882	4.4	14.0	21.4
1890–1892	3.9	10.5	17.1
1900–1902	3.8	8.5	13.4
1910–1912	4.4	7.9	13.8

Table E shows that the illegitimate birth-rate per 1,000 of unmarried and widowed women, 15 to 45 years of age, fell in Ireland from 5.6 in 1870-2 to 3.8 in 1900-2, but rose to 4.4 in 1910-12.

The rate for England and Wales fell steadily from 16.9 in the first period to 7.9 in the last, or 53 per cent., while in Scotland the rate, which was 24.5 per 1,000 in 1870-2, fell to 13.4 in 1900-2, but rose slightly to 13.8 in 1910-12, the last figure showing a decrease of 44 per cent. as compared with the figure for 1870-2.

In consequence of the uncertainty of intercensal estimates of the number of the unmarried and widowed women 15 to 45 years of age in the population, it has been considered more satisfactory to obtain results by triennial periods with the year of the Census as the middle year. Thus while the number of births for a period of three years is quite large enough in order to secure reliable results, possibility of error that might be expected to result from more or less doubtful estimates in intercensal years is thereby reduced to a minimum.

Fertility of Marriage.

It will be noted that the rates for the total births have been given in terms of the total population, in other words, the crude birth-rates were presented. They serve as a measure of the increase in a population, and they have the advantage of being readily calculated. Moreover, the total population and the total births are in many localities the only statistics available on which to base this calculation.

As the proportion of married women of maternity age in the population varies in different countries, it is easy to see that a comparison of the crude birth-rates between one country and another may be misleading. A comparatively low crude birth-rate may be expected when the proportion of wives 15 to 45 years of age is low in comparison with other countries, and *vice versâ*. More reliable results will, therefore, be obtained when the birth-rate is stated in terms of legitimate births in proportion to the number of married women aged 15 and under 45 in the population. This is done in the following Table by triennial periods from 1870 to 1912, the middle point in each of the periods being the Census year.

TABLE F.—*Showing the number of Legitimate Births per* 1,000 *Married Women between the ages of* 15 *and* 45 *years in Ireland, as compared with England and Wales, and Scotland, during the periods* 1870-1872, 1880-1882, 1890-1892, 1900-1902, *and* 1910-1912.

PERIOD	LEGITIMATE BIRTHS PER 1,000 MARRIED WOMEN, 15-45 YEARS OF AGE		
	Ireland	England and Wales	Scotland
1870–1872	306.6	291.1	319.4
1880–1882	282.9	285.3	311.5
1890–1892	287.6	262.1	296.4
1900–1902	289.4	235.0	271.8
1910–1912	292.7	197.1	233.2

It was shown in Table C that the highest crude birth-rate in the fifty years covered by that Table was reached in

Ireland as well as in Great Britain during the period 1871-5. The proportion of legitimate births per 1,000 married women aged 15 to 45 was also highest in the period 1870-2, viz., 306.6 for Ireland, 291.1 for England and Wales, and 319.4 for Scotland. The rate for Ireland would appear to fall from 306.6 in 1870-2 to 282.9 in 1880-2; the rate for England and Wales shows a smaller reduction, from 291.1 to 285.3, and for Scotland from 319.4 to 311.5.

But while the proportion for Ireland continued to rise steadily from 282.9 in the period 1880-2 to 292.7 in 1910-12, showing an increase of 3.5 per cent., the rate for England and Wales fell continuously from 291.1 in 1870-2 to 197.1 in 1910-12, a fall equivalent to 32.3 per cent., and that for Scotland during the same period shows a reduction from 319.4 to 233.2 or 27.0 per cent.

It will also be observed that the greatest decrease in any one period as compared with the preceding, as shown by the English and Scottish results, occurred in the period 1910-12. In England and Wales the legitimate birth-rate fell from 235.0 in 1900-2 to 197.1 in 1910-12 or 16.1 per cent., and in Scotland it fell from 271.8 to 233.2, or 14.2 per cent.

During the period 1880-2, the rate recorded for Ireland was less than that for either England or Scotland; in 1910-12 the Irish rate exceeded the English by 48.5 per cent. and the Scottish by 25.5 per cent.

It may be noted as significant that the great increase in the wealth of Great Britain in recent years coincides with the rather serious decline in the birth-rate there. Other countries, too, have the same tale to tell, but while the fertility of married women in Great Britain and many other countries has seriously declined with increased prosperity, Ireland has actually improved her position under similar conditions.

Table G is interesting in that it shows the average number of legitimate births registered per 1,000 married women 15 to 45 years of age in Ireland by county and pro-

vincial areas. Co. Dublin comes lowest on the list with 208.8, and Co. Mayo highest with 359.2. It is a well-known fact that from Co. Dublin a number of births take

TABLE G.—*Showing the average number of Births registered in the 3 years,* 1910-12, *per* 1,000 *Married Women between the ages of* 15 *and* 45 *years.*

COUNTY	Number of Births in 1910–12 per 1,000 Married Women Aged 15 to 45 Years	COUNTY	Number of Births in 1910–12 per 1,000 Married Women Aged 15 to 45 Years
Mayo	359.2	L'derry Co. and City...	293.6
Galway	356.6	Cork Co. and City ...	293.3
Donegal	347.6	Carlow	292.4
Kerry	345.5	Westmeath ...	291.9
Sligo	341.6	Waterford Co. and City	288.7
Limerick Co. and City	322.6	Kildare	284.5
Leitrim	315.1	Meath	281.9
Roscommon ...	312.1	Armagh	277.7
Clare	310.4	Antrim	268.0
Cavan	309.8	Down	256.1
Tipperary	308.7	Wicklow	251.7
Kilkenny	306.8	Belfast City ...	250.4
Longford	305.9	Dublin County ...	208.8
Dublin City ...	300.9		
Wexford	300.0		
King's	299.3	PROVINCES.	
Monaghan	298.8		
Queen's	298.8	Connaught	344.7
Formanagh ...	295.6	Munster	308.7
Tyrone	295.0	Leinster	282.0
Louth	294.3	Ulster	276.0
		Ireland ...	292.7

place in the lying-in or other hospitals in the city of Dublin, in which area they are registered. Therefore, the figure mentioned for the county is lower than it should be, and hence the rate shown for the Dublin County Borough

is overstated. A rate for the combined county and city would be more satisfactory, and that is found to be 272.0 per 1,000. The next lowest on the list is Belfast Borough with 250.4 per 1,000, as compared with 359.2 per 1,000 for Mayo, the latter showing a rate of 43 per cent. higher than that for Belfast. It is also to be noted that the six counties with the highest rates are on the western seaboard, the five lowest areas on the eastern seaboard, and the five in centre of the list are all inland counties. The difference between the provinces is not so marked, viz., Connaught with 344.7 per 1,000 as against Ulster with 276.0, the former figure being about 25 per cent. higher than the latter.

In the Census of 1911, for the first time, particulars regarding marriages as existing at the date thereof were obtained, and the results are given in the General Report of that Census—ages of husband and wife, duration of existing marriage, number of children born alive and the number who had died. In the preceding Tables, allowance was not made for the age of wife at marriage, nor for the duration of marriage, simply average annual births to every 1,000 married women (15-45 years) were given for different periods of time, the population having been taken from the Census Reports and the births from the Registrar-General's Annual Reports.

I now propose to supply more precise information regarding fertility in Ireland, England and Wales, and Scotland, by (*a*) ages of wives at marriage, and by (*b*) durations up to 20 years, which information, as before referred to, has been derived from the Census Reports of the three countries. I may observe here that it would not be possible within the ambit of this paper to give the full results of a study of the Census figures as published; indeed, one's difficulty in a paper on Vital Statistics such as this lies in curtailment rather than in amplification. Suffice it to say, that a close investigation of the Census figures by the diligent student will be amply rewarded.

TABLE H.—*Showing, by Ages of Wives at Marriage, for Ireland, England and Wales, and Scotland, the average number of Children born alive Per Married Woman, in the cases of Marriages (as existing at the date of the Census of* 1911) *under 5 years' duration, 5 and under* 10 *years,* 10 *to* 15, *and* 15 *to* 20 *years. [Derived from the Census Reports of the respective countries.]*

Ages of Wives at Marriage	Ireland	England and Wales	Scotland
	Duration of Marriage—Under 5 Years		
	Average number of Children per Married Woman		
15–20 years	1.26	1.28	1.36
20–25 ,,	1.14	1.03	1.21
25–30 ,,	1.01	0.80	0.97
30–35 ,,	0.90	0.69	0.82
35–40 ,,	0.63	0.51	0.59
15–40 ,,	1.01	0.92	1.07
	Duration of Marriage—5 and under 10 Years		
15–20 years	3.20	2.92	3.19
20–25 ,,	3.12	2.44	2.84
25–30 ,,	3.01	1.98	2.37
30–35 ,,	2.58	1.70	2.01
15–35 ,,	2.98	2.27	2.63
	Duration of Marriage—10 and under 15 Years		
15–20 years	4.94	4.38	4.87
20–25 ,,	4.80	3.61	4.24
25–30 ,,	4.35	2.85	3.44
15–30 ,,	4.64	3.47	4.05
	Duration of Marriage—15 and Under 20 Years		
15–20 years	6.47	5.69	6.31
20–25 ,,	6.24	4.61	5.42
15–25 ,,	6.30	4.84	5.61

It would appear from the preceding Table that during the first five years of married life among women 15 to 40

years of age at marriage, the average number of children per marriage was 1.01 for Ireland, 0.92 for England and Wales, and 1.07 for Scotland. Thus Ireland shows a rate slightly over that for England and Wales, but a fraction under that for Scotland. In the next duration (5-10 years) for women 15-35 years at marriage it will be seen that Ireland shows an increase over the other countries not alone in the total but at each age period. A similar increase also occurs with reference to the duration 10 to 15 years for women aged 15 to 30 years of age at marriage, and for marriages 15 to 20 years in duration the ages of the wives at marriage being from 15 to 25 years. In this last category the average number of children to a marriage was, for Ireland, 6.30, for England and Wales 4.84, and for Scotland 5.61.

A feature in Table H is the light it throws on the comparative effects of delayed marriage in Ireland, England and Wales, and Scotland. In Ireland, it will be noted, the fertility among married women in the successive quinquennial age periods up to 30 years of age does not show any very material difference, while in the other countries this difference is appreciable.

As this subject is of public importance I have elaborated somewhat on the first and last sections of this Table by showing particulars relating to the size of families in the three countries.

With reference to wives who were under 5 years married at the date of the Census, and aged 15 to 35 years at date of marriage, it will be seen that 34.6 per cent. of these married women in Ireland were childless during that period of married life, the corresponding percentage of childless women in England and Wales being 35.2, and 29.6 in Scotland.

Regarding the children born, the Table shows in this short duration the tendency in Ireland to "long" families, for 22.1 per cent. of the Irish children occurred in families of 3 and upwards as against 15.2 per cent. of the English and 20.0 per cent. of the Scottish.

The children who died are represented by 83.3 per 1,000 born in Ireland among these families, as compared with 97.0 per 1,000 in England and Wales. Similar informa-

TABLE I.—*Showing for England and Wales, Ireland, and Scotland, in relation to Wives 15 and under 35 years of age at Marriage, the duration of which was under 5 years at the date of the Census of 1911, the number of Children Born Alive according to size of family, with particulars regarding the Mortality and the Survivors among these children.*

IRELAND.

Size of Family	Wives Aged at Marriage, 15–35 Years		Children (Mothers, 15–35 Years of Age at Marriage. Duration of Marriage, Under 5 Years)						
			Children Born Alive		Children Dead		Survivors in 1911		
	No.	Percentage of Total	No.	Percentage of Total	No.	Per 1,000 Born Alive in each class of Family	No.	Per 1,000 Born in each class of Family	Percentage of Total
0	26,925	34.6	.	.	.	.	.	.	.
1	26,535	34.1	26,535	32.5	1,538	58.0	24,997	942.0	33.4
2	18,581	23.9	37,162	45.4	2,963	79.7	34,199	920.3	45.6
3	5,226	6.7	15,678	19.2	1,875	119.6	13,803	880.4	18.4
Over 3	573	0.7	2,378	2.9	431	181.2	1,947	818.8	2.6
Total	77,840	100.	81,753	100.	6,807	83.3	74,946	916.7	100.

ENGLAND AND WALES.

0	355,937	35.2	.	.	.	.	.	.	.
1	415,862	41.1	415,862	43.9	25,380	61.0	390,482	939.0	45.7
2	193,766	19.1	387,532	40.9	40,198	103.7	347,334	896.3	40.6
3	41,247	4.1	123,741	13.1	21,012	169.8	102,729	830.2	12.0
Over 3	4,833	0.5	19,816	2.1	5,262	265.5	14,554	734.5	1.7
Total	1,011,645	100.	946,951	100.	91,852	97.0	855,099	903.0	100.

SCOTLAND.

0	33,991	29 6	.	.	.	.	.	.	.
1	44,967	39 2	44,967	35 7	–	–	–	–	–
2	27,848	24 2	55,696	44 3	–	–	–	–	–
3	7,110	6.2	21,330	17.0	–	–	–	–	–
Over 3	912	0.8	3,738	3.0	–	–	–	–	–
Total	114,828	100.	125,731	100.	–	–	–	–	–

tion for Scotland is not available. In Ireland among every thousand children born alive to mothers, 15-35 years of age at marriage and under 5 years married, 916.7 survived at the date of the Census, and, under the same conditions in England and Wales, 903.0 survived

On the same lines the following Tables relating to married women 15 to 25 years at marriage, and 15 to 20 years married are constructed.

Table J. (i).—*Showing for Ireland, in relation to Wives 15 and under 25 years of age at Marriage, the duration of which was from 15 to 20 years at the date of the Census of* 1911, *the number of Wives and the number of Children Born Alive according to size of family, with particulars regarding the Deaths and the Survivors.*

IRELAND

Size of Family	Wives Aged at Marriage, 15–25 Years		Children (Mothers, 15–25 Years of Age at Marriage. Duration of Marriage, 15–20 Years)						
			Children Born Alive		Children Dead		Survivors in 1911		
	No.	Per-centage of Total	No.	Per-centage of Total	No.	Per 1,000 Born Alive in each class of Family	No.	Per 1,000 Born in each class of Family	Per-centage of Total
0	1,836	5.5	.	.	.	.	.	.	.
1	1,032	3.1	1,032	0.5	98	95.0	934	905.0	0.6
2	1,386	4.2	2,772	1.3	384	138.5	2,388	861.5	1.4
3	1,884	5.7	5,652	2.8	704	124.6	4,948	875.4	2.9
4	2,567	7.7	10,268	5.0	1,368	133.2	8,900	866.8	5.2
5	3,361	10.2	16,805	8.2	2,311	137.5	14,494	862.5	8.5
6	4,326	13.1	25,956	12.7	3,685	142.0	22,271	858.0	13.1
7	4,990	15.1	34,930	17.1	5,040	144.3	29,890	855.7	17.5
8	4,686	14.2	37,488	18.3	5,911	157.7	31,577	842.3	18.5
9	3,307	10.0	29,763	14.5	5,525	185.6	24,238	814.4	14.2
10	2,012	6.1	20,120	9.8	4,093	203.4	16,027	796.6	9.4
11	889	2.7	9,779	4.8	2,253	230.4	7,526	769.6	4.4
12 and over	806	2.4	10,146	5.0	2,740	270.1	7,406	729.9	4.3
Total	33,082	100.	204,711	100.	34,112	166.6	170,599	833.4	100.

TABLE J. (ii.).—*Showing, for England and Wales, in relation to Wives 15 and under 25 years of age at Marriage, the duration of which was from 15 to 20 years at the date of the Census of 1911, the number of Wives, and the number of Children Born Alive according to size of family, with particulars regarding the Deaths and the Survivors.*

ENGLAND AND WALES.

Size of Family	Wives Aged at Marriage, 15–25 Years		CHILDREN (MOTHERS, 15–25 YEARS OF AGE AT MARRIAGE. DURATION OF MARRIAGE, 15–20 YEARS)						
			Children Born Alive		Children Dead		Survivors in 1911		
	No.	Per-centage of Total	No.	Per-centage of Total	No.	Per 1,000 Born Alive in each class of Family	No.	Per 1,000 Born in each class of Family	Per-centage of Total
0	24,400	5.2	.	.	.	.	.	.	.
1	33,160	7.0	33,160	1.4	3,435	103.6	29,725	896.4	1.6
2	52,150	11.0	104,300	4.6	12,470	119.6	91,830	880.4	5.0
3	59,394	12.6	178,182	7.8	25,827	144.9	152,355	855.1	8.3
4	58,426	12.4	233,704	10.2	38,014	162.7	195,690	837.3	10.7
5	54,269	11.5	271,345	11.9	46,925	172.9	224,420	827.1	12.3
6	52,707	11.2	316,242	13.9	58,316	184.4	257,926	815.6	14.1
7	48,270	10.2	337,890	14.8	65,432	193.6	272,458	806.4	14.9
8	39,029	8.3	312,232	13.7	67,171	215.1	245,061	784.9	13.4
9	25,244	5.3	227,196	10.0	54,931	241.8	172,265	758.2	9.4
10	14,034	3.0	140,340	6.1	38,873	277.0	101,467	723.0	5.6
11	6,323	1.3	69,553	3.0	21,289	306.1	48,264	693.9	2.7
12 and over	4,741	1.0	59,734	2.6	22,410	375.2	37,324	624.8	2.0
Total	472,147	100.	2,283,878	100.	455,093	199.3	1,828,785	800.7	100.

Table J. (iii.).—*Showing, for Scotland, in relation to Wives* 15 *and under* 25 *years of age at Marriage, the duration of which was from* 15 *to* 20 *years at the date of the Census of* 1911. *the number of Wives and the number of Children Born Alive according to size of family.*

SCOTLAND.

Size of Family	Wives Aged at Marriage, 15–25 Years		Children (Mothers, 15–25 Years of Age at Marriage). Duration of Marriage, 15–20 Years	
			Children Born Alive	
	Number	Percentage of Total	Number	Percentage of Total
0	2,197	4.4	.	.
1	2,030	4.0	2,030	0.7
2	3,170	6.3	6,340	2.3
3	4,389	8.8	13,167	4.7
4	5,413	10.8	21,652	7.7
5	6,236	12.4	31,180	11.1
6	6,570	13.1	39,420	14.0
7	6,813	13.6	47,691	16.9
8	5,995	11.9	47,960	17.0
9	3,974	7.9	35,766	12.7
10	2,015	4.0	20,150	7.2
11	842	1.7	9,262	3.3
12 and over	547	1.1	6,864	2.4
Total	50,191	100.	281,482	100.

It would appear from the preceding Tables that in Ireland, of the wives selected, 5.5 per cent. were childless, as against 5.2 per cent. for England and Wales, and 4.4 per cent. for Scotland. Thirteen per cent. of the wives in Ireland aged 15 to 25 years at marriage were mothers of families of 3 children or under, as compared with 30.6 per cent. for England and Wales, and 19.1 per cent. for Scotland. As regards families of from 4 to 6 children, 31.0 per cent. of the Irish married women were mothers, 35.1 per cent. of the English, and 36.3 per cent. of the Scottish, while for families of 7 children and upwards, the percentage of mar-

ried women aged at marriage 15 to 25 years and married from 15 to 20 years was 50.5 in Ireland, the corresponding percentage for England and Wales being 29.1, and for Scotland 40.2.

With reference to the children born, only 4.6 per cent. in Ireland, as against 13.8 per cent. in England and Wales, and 7.7 per cent. in Scotland related to families of 3 and under; 25.9 per cent. of the children born in Ireland occurred in families 4 to 6 in size, as compared with 36.0 per cent. in England and Wales, and 32.8 per cent. in Scotland. The children belonging to families of 7 and upwards in Ireland were 69.5 per cent. of the total births; those belonging to such families in England and Wales represented 50.2 per cent., and those relating to Scotland were 59.5 per cent. of the total number of children born alive to wives whose marriage ages were from 15 to 25 years and who were married from 15 to 20 years.

In connection with mortality, it may be noted that the rate per 1,000 born alive for Ireland varied from 95.0 for families of one to 270.1 for families of 12 and upwards, as against a range from 103.6 in families of one to 375.2 in families of 12 and upwards for England and Wales.

Of the survivors at the date of the Census of 1911, only 4.9 per cent. related to families of 3 or under as against 14.9 per cent. for England and Wales; 26.8 per cent. related to families 4 to 6 children in size in comparison with 37.1 per cent. for England and Wales; for Ireland families of 7 children and upwards accounted for 68.3 per cent. of the total survivors, the corresponding percentage for England and Wales being 48.0.

It will be gathered from the foregoing :—

1. That the marriage rate for Ireland is low, and has not undergone much change during the period.

2. That the average age at marriage is appreciably higher for Ireland than that for England and Scotland.

3. That the crude birth-rate (*i.e.*, the rate per 1,000 of the total population) is comparatively low in Ireland, but

has remained practically stationary for a number of years, whereas in other countries it has rapidly decreased.

4. That the real birth-rate (number of legitimate births per 1,000 married women aged 15-45 years) is much higher for Ireland than for England and Wales and Scotland.

5. That the illegitimate birth-rate is much less in Ireland than in England and Wales, and Scotland.

Art. VIII.—*Endothelioma of the Ovary.*[a] By James S. Ashe, M.D.

Before speaking on the condition generally I will give the history of the case.

Mrs. J., aged 35, had one child ten years ago. Five years ago she ceased to menstruate and became anæmic and weak; she lost weight and was very nervous. She was treated with various tonics but did not improve. She came to consult me for sterility, when on vaginal examination I found the right ovary enlarged to about the size of a tangierine orange. I had a consultation with Dr. Purefoy, and we decided to operate, and removed the right ovary; the left appeared to be quite normal and it was not removed. On submitting the specimen to Dr. Rowlette he reported it to be an endothelioma. And now for the sequel. She began to menstruate regularly three months after the operation and became pregnant, and I had the pleasure of attending her in her confinement some months since, which was quite uneventful. Since then she has been quite well and strong.

Sir William Smyly has laid it down in his excellent teaching: "If you want to know a subject write a paper about it." Well certainly one can know more than perhaps one would form from mere reading a history; but to be candid with you, after looking up various authorities to get some help to write a paper I am struck with how little they have to say on the subject and on the allied condition

[a] Read before the Section of Obstetrics in the Royal Academy of Medicine in Ireland on Friday, January 10, 1919.

—gyroma. Endothelioma of the ovary can occur in children, but the average age is about 55. There are two varieties, as in the uterus—originating (*a*) from the lymph canals or (*b*) from the peritoneal covering; our case was of the former variety. The peritoneal variety is in time disseminated through the entire peritoneal cavity, and consists of grape-like bodies consisting of large flat cells indistinguishable from and continuous with those of the peritoneum covering them.

The symptoms are: pain, often agonising—such a symptom entirely absent in our case—a progressive emaciation and carbutic appearance and loss of weight (these symptoms were present but not to a marked degree). At the time the specimen of the ovary was shown at the Academy the chief points of interest were the importance of early operation in any case of enlarged ovary, and the removal of the second ovary. It was held by the majority of the speakers that this ought to have been done, but I think you will agree with me that the policy of "wait and see" was better than "push and go" for once, even with a strong coalition against you.

CONGENITAL ABSENCE OF LEFT LUNG.

Dr. A. H. Tebbutt, Chief Resident Pathologist, Royal Prince Alfred Hospital, Sydney, reported to the New South Wales Branch of the British Medical Association on October 11, 1918, the case of a boy, aged twelve, admitted to hospital under the care of Dr. S. A. Smith, with a history of headaches and pains in the arms and legs for two months. The patient developed a malignant endocarditis, apparently of rheumatic origin, and died of a terminal diarrhœa after one month in hospital. At the autopsy, the right lung was found to be bulky, and it had apparently pushed the heart to the left side. There was no vestige of the left lung, the left side of the thorax being occupied by the heart, the distended pericardial sac, and pericardial adhesions. In the heart were found a patent *foramen ovale*, malignant endocarditis affecting the aortic valves and a recent but almost healed mitral endocarditis. The case is fully reported in *The Medical Journal of Australia* for November 23, 1918 (page 430).

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES

Surgical Aspects of Typhoid and Paratyphoid Fevers. Founded on the Hunterian Lecture for 1917—amplified and revised. By A. E. Webb-Johnson, D.S.O., M.B., Ch.B. (Vict.), F.R.C.S. (Eng.); Temporary Colonel, Army Medical Service; Consulting Surgeon, British Expeditionary Force, France; Hunterian Professor of Surgery, Royal College of Surgeons of England; Assistant Surgeon to the Middlesex Hospital. With Foreword by Lieut.-General T. H. Goodwin, C.B., C.M.G., D.S.O.; Director-General, Army Medical Service. London: Henry Frowde and Hodder & Stoughton. 1919. Demy 8vo. Pp. 190.

This beautifully printed book, dedicated to the Royal Army Medical Corps, possesses a twofold value. In the first place, it opens with a most interesting historical sketch of the early and modern records of typhoid fever, illustrated by a veritable portrait-gallery of medical worthies whose names are associated with the disease—from Thomas Willis, in the seventeenth century, to Professor W. W. Keen, of Philadelphia, who is still, happily, alive. In addition to the medical portraits, there is a likeness in medieval style of Henry, Prince of Wales, eldest son of King James I., who died in 1612 of a fever epidemic at the time, and who was attended in his fatal illness by Sir Theodore de Mayerne. The exact account left by Sir Theodore enabled Dr. Norman Moore to recognise the Prince's illness as being due to typhoid fever, although the physicians of the time could not go further than to say that it was a fever. Dr. Moore's article "On the Illness and Death of Henry, Prince of Wales: An Historical Case of Typhoid Fever," was published in 1881, and will be found in the seventeenth volume of *Saint Bartholomew's Hospital Reports*.

But apart from its historical side, Colonel Webb-Johnson has succeeded in giving us a most excellent and instructive account of the typhoid group of fevers viewed from the surgical aspect. In his "Foreword" the Director-General of the Army Medical Service points out that these diseases have usually been regarded as falling to such a large extent within the province of the physician that the surgical complications and sequels have perhaps not received attention to the degree which they merited. He tells us that the author of this book had unique opportunities for closely observing a large series of cases, and, with the Director-General, we hold that Colonel Webb-Johnson utilised his opportunities to the best possible advantage.

For his analysis of the surgical complications of the typhoid group of fevers, the author took the cases admitted to the largest British Isolation Hospital in France during the first two years of its existence. In a Table at page 47, he classifies 2,500 cases diagnosticated as either Typhoid, Paratyphoid A, or Paratyphoid B. The typhoid cases numbered 1,118, of which 821 had been inoculated and 297 had not been inoculated. Of all these cases, the mortality per cent. was 7.51. But the controlling influence of inoculation over the death-rate is clearly demonstrated by the figures 19.19 per cent. mortality in the non-inoculated and only 3.28 in the inoculated. Of paratyphoid A. there were 344 cases—123 inoculated and 221 not inoculated. The mortality amongst all this group was only 0.29 per cent., *nil* among the inoculated, and 0.45 among the non-inoculated. Of paratyphoid B. there were 1,038 cases, with a general mortality of 1.68 per cent. Only one death occurred among 239 inoculated cases in this group, and that patient had lympho-sarcoma. Of the remaining 799 patients, 17 died, giving a mortality of 2.12 per cent.

Among the total number of cases, 2,500, there were 103 deaths, the mortality per cent. being 4.12.

Two salient facts stand out from this Table—the comparative mildness of Paratyphoid A. and the conspicuous control over the death-rate exercised by inoculation.

In succeeding chapters the author gives a general review of the surgical complications of a typhoid or a paratyphoid infection. They are summarised and analysed in Table II., facing page 53, a Table which embodies an immense amount of clinical observation and of classification.

In Chapter V., on the Spleen, the author mentions rupture and abscess of this organ which "forms a prominent feature of the clinical picture, and plays an important part in the pathology of the typhoid group of fevers, but is seldom the seat of surgical complications." We agree with him in thinking that the most interesting points about the spleen in these fevers are its *rôle* in the general pathology of enteric fever especially, and the relation to infection of the biliary passages, and to the persistence of typhoid group bacilli in the body. To these subjects he returns in one of the most suggestive and novel chapters in the book (Chapter XVI.), in which he discusses the surgical aspects of the "carrier problem." The author's views are singularly attractive, and afford ground for anxious thought. Briefly stated, he regards the spleen as a scavenger, ridding the circulation of infecting organisms, sometimes enlarging to a great size, to deal with the strain thrown upon it; and the bile as the splenic effluent for "the sediment from the hepatic filter," which has removed noxious substances, including bacteria, from the blood coming to it from the gastro-intestinal tract and spleen, especially the spleen. When the spleen is not able to perform its scavenging function it may harbour the typhoid organisms for an indefinite time, and so constitute an individual a "carrier."

The author's views on parotitis are equally novel and suggestive.

The work is fully illustrated, and forms a welcome and valuable addition to the bibliography of a group of fevers, which for the first time in the greatest war of all the ages, thanks to medical skill and science, has forfeited its claim to the names of "Camp Fever" or "Die Kriegspest," given long ago to typhus. J. W. M.

Modern Chemistry and Chemical Industry of Starch and Cellulose (with reference to India). By TARINI CHARAN CHANDHURI, M.A. Calcutta: Butterworth & Co. (India), Ltd. 1918. Cr. 8vo. Pp. viii + 156.

THIS monograph has been written chiefly with the object of giving an impetus to the chemical industries in India which are dependent on starch and cellulose as raw materials. The subject—which is divided into two parts, (1) theoretical, (2) industrial—is dealt with in a semi-popular manner, so that an elementary knowledge of chemistry is sufficient to enable the reader to understand the various processes described.

All the different substances which may be manufactured from starch and cellulose are dealt with as fully as is possible in a work of 150 pages, and the matter has been brought well up-to-date.

The book should prove very useful to all Indian students interested in developing the chemical resources of their country. E. A. W.

Diseases of the Digestive Organs, with Special Reference to their Diagnosis and Treatment. By CHARLES D. AARON, Sc.D., M.D., Professor of Gastroenterology in the Detroit College of Medicine and Surgery; Consulting Gastroenterologist to Harper Hospital. Second Edition, thoroughly revised. Philadelphia and New York: Lea & Febriger. 1918. Large 8vo. Pp. xlvii + 818.

THIS is a rather bulky volume of over 800 pages, and deals not only with diseases of the alimentary tract proper, but also with diseases of the liver, gall-bladder and pancreas. Although the book as a whole is fairly complete, it suffers in our opinion from this attempt by the author to include too much in a sort of general survey of the diseases of all the digestive organs, and in consequence is decidedly sketchy in parts. For example, the author, writing on "Affections of the Pharynx," occupies just two pages, and he includes just five lines on the subject of Follicular Tonsillitis, exclusive of treatment, and the same number of lines on Suppurative Tonsillitis.

The first chapter deals in a decidedly brief way with the physiology of digestion; the succeeding four are concerned with examination of the stomach and duodenal contents, with examination of the fæces, and with *x*-ray examination of the alimentary canal. These four chapters are good, but the author, though describing many methods, fails, we think, to indicate sufficiently the methods that he has personally used and found of value.

Useful chapters on diet, and on various methods of treatment follow, and then commences the systematic account of the diseases with which the book deals. This last part of the book, which constitutes about two-thirds of the whole, is by far the most satisfactory portion, and will be found of value, either for direct perusal or for reference, to the general practitioner, and also to some extent to the specialist.

The book is well printed on good paper, and is well illustrated. Most of the prescriptions given as examples are written in both the metrical and the English systems.

The "Wellcome" Photographic Exposure Record and Diary. 1919.

This useful and popular Diary is, as usual, all that can be desired in quality and up-to-date methods. The exposure calculator has been improved, and not only does it tell the exact exposure for any subject at any time of the day and year by one turn of the scale, but it also shows the correct exposure opposite each stop when using practically any of the popular rapid plates and films. When using plates of different speed values, a second slight movement of the same scale gives the correction for speed, and again shows the correct exposure opposite each stop.

The usual chapter on the principles of exposure is included, and makes this difficult question clear. There are also special notes and tables regarding telephotography, and exposures for moving objects, indoor and outdoor photography, and photography by artificial light.

The book also contains concise accounts of the methods

of development, toning, intensification, reduction, &c., under almost every variety of circumstance.

The photographic illustrations are beautifully reproduced, and of interest, and show clearly what can be done in the way of artistic photography. The Weekly Diary and records of negative and positive exposures remain as in the 1918 edition.

Considering the present high cost of plates and other materials, the price of the book—eighteen pence—is extremely reasonable. M. S. M.

Diabetes and its Dietetic Treatment. By B. D. Basu, Maj., I.M.S. (Retired). Ninth Edition, revised and enlarged. Allahabad: The Panini Office, Bhuvaneshvari, Bahadurganj Ashram. 1918. Cr. 8vo. Pp. viii + 104.

This is divided into two parts: I. What is Diabetes? and II. The Dietetic Treatment of Diabetes.

In Part I. the author gives a synopsis of the various assignable causes of the condition, but confesses in the first page that "the etiology and pathology of this disease remains as obscure to-day as they were in the days of Charaka and Susrata." This is not very encouraging. We know little, to be sure, but have advanced somewhat beyond the knowledge of these "Hindu physicians of yore."

It would be a valuable step if we were able to recognise a "pre-glycosuric or pre-diabetic stage," but fear that the symptoms given will not help us much to make it out in this country. "In some, the symptoms are those of what is vaguely termed indigestion or dyspepsia. Constipation is an early symptom; another, is burning sensation of the hands and feet. Some suffer from polyuria or nycturia. Dilatation of the stomach may be observed in many. If the mouth is examined oral sepsis, such as pyorrhœa alveolaris, is discovered in not a few. The terminal end of the alimentary canal shows also, not unfrequently, the existence of piles. Hydrocele is also very often present. . . . There is often arterial tension or high blood-pressure. This occasionally causes arterial spasm, producing convulsions. In India, everyone after 40 years of age should be often examined with a sphygmometer for measuring blood-

pressure." This list of symptoms is not very convincing, and the last suggestion opens up a fine field of employment for medical men, but does not show how it will help the diabetics.

In Part II., the various dietetic cures are mentioned. Even Allen's treatment, though his name is not given, which has produced more striking results than any hitherto attempted, is referred to, and dealt with as follows :—" It is noticed that diabetic patients improve by fasting. Of late, some physicians have been treating diseases by fasting. This fasting cure, of course, relieves alimentary toxæmia, and so proves beneficial in diabetes. Hence the importance of starvation and purgation in diabetes. There should be no over-indulgence in food." We cannot find any further reference to this treatment.

Blood Transfusion, Hæmorrhage, and the Anæmias. By BERTRAM BERNHEIM, A.B., M.D., F.A.C.G. ; Instructor in Clinical Surgery, The Johns Hopkins University. Philadelphia and London : J. B. Lippincott Company. Demy 8vo. Pp. xix + 259.

AN apology is necessary for the delay in reviewing this book, the preface of which bears the date May, 1917, but which only reached us a few months ago. Undoubtedly, a systematic work of this kind is an urgent need, and when the abundant experience of many surgeons during the war has been collected and sifted, a further edition will, we feel sure, be called for.

The book commences with a short historical note, and then proceeds to deal with the phenomena of bleeding, the diagnosis of concealed hæmorrhage, and the methods of control of hæmorrhage that were available prior to the introduction of transfusion.

The indications for and dangers of transfusion are then dealt with, and a carefully detailed chapter describing the technique of the different methods in vogue follows. The succeeding chapters deal with the application of transfusion in different conditions; and, lastly, an appendix describes the method of classifying donors in the four groups identified by Moss. This book should be read not

only by those likely to be called upon to practice transfusion, but also by medical men in general, who, as a group, should be informed on the subject.

An Almanack for the Year of Our Lord, 1919. By Joseph Whitaker, F.S.A. London: 12 Warwick Lane, Paternoster Row. 1919. 8vo. Pp. 1,005.

The publication of this year's valuable Vide Mecum—as we feel justified in calling "Whitaker's Almanack"—was delayed in order that the results of the General Election held in December last might be included. The list of the members of the House of Commons of the Third Parliament of King George V. is given at page 170. Figures denoting the total number of electors follow the name of each constituency, separate figures showing the number of women electors included in the larger total are appended in each case. Then the number of votes polled by the successful and unsuccessful candidates follow, the political "colour" of each candidate being denoted by initial letters; for example, "Co. U." means "coalition unionist," and so on. At page 183 there is an alphabetical list of Members of Parliament, which will be found most useful.

The influence of the World War is evident throughout this year's Almanack. Nine closely printed columns contain the names of the heroic recipients of the Victoria Cross, while the Companions of the Distinguished Service Order fill four columns of more than 27 pages—from 743 to 770 and half of page 771. Besides, there is a very full diary of the War from November 1, 1917, to November 11, 1918—the late date being that of the signing of the Armistice. But the most interesting feature of the book in relation to the War is the record of recent alterations in the governments and territories of various States. A double-page map, illustrating the racial divisions of Europe, and also a map of Mesopotamia, have been inserted in this part of the Almanack.

A substantial increase in price has taken place, for the Almanack costs six shillings net, compared with last year's price of three shillings and sixpence. Nevertheless, the book is cheap at the enhanced cost

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

THE WORTH LIBRARY, STEEVENS' HOSPITAL, DUBLIN.[a]

By T. Percy C. Kirkpatrick, M.D., M.R.I.A.; Fellow and Registrar, Royal College of Physicians of Ireland.

My first duty is to extend to the members of the Bibliographical Society of Ireland a very cordial welcome on behalf of the Governors and Guardians of Doctor Steevens' Hospital on this the first visit of the Society to our ancient hospital.

We are very proud of our long tradition, and of the treasures that have been handed down to us from the past; and we are delighted to recount that tradition, and to show those treasures to all who are interested in them.

Before I introduce you to our Library I may, perhaps, be allowed to tell you in a few words something of its origin, and of the building in which it is enshrined.

At the time of the Commonwealth in England, there was one John Steevens, a clergyman, who held a cure in Wiltshire. He belonged to the Royalist party, and by expressing too boldly his loyalty to Charles I. he incurred the anger of Cromwell. To escape from the effects of this he had to fly the country, and came to Ireland with his wife and infant children, Richard and Grissel, who were twins. At the Restoration of Charles II. John Steevens was rewarded for his loyalty by being appointed Vicar of Athlone—a post which he held till his death in 1682.

In due course Richard Steevens entered Trinity College, Dublin, and was elected a Scholar in 1674. In the following year he graduated Bachelor in Arts, and Master in 1675. He studied divinity, and was admitted to deacon's orders; but after his father's death he gave up theology for medicine, and

[a] An Address read before the Bibliographical Society of Ireland on September 10th, 1918.

was admitted to the Doctor's degree in that faculty in 1687. In the charter of William and Mary, 1692, he was nominated one of the Fellows of the King and Queen's College of Physicians, and was elected President of the College in 1703, and again in 1710.

Richard Steevens appeared to have enjoyed considerable reputation in his practice, and managed to acquire landed property to the value of about £600 a year. He never married, and the twin brother and sister lived together in Dublin after their parents' death. On December 14th, 1710, he made his will, and he died the next day. Having ascertained that his sister did not intend to marry, Richard left his property to her for her life, and after her death to certain trustees to build " or otherwise provide one proper place or building within the city of Dublin for maintaining and curing from time to time such sick and wounded persons whose distempers and wounds are curable."

There was not at that time any hospital in Dublin for treating the sick and wounded of the civil population, though there was plenty of work for such a place. Poverty and sickness were rife in the city, and accidents were frequent in the badly-lighted and ill-protected streets. Under these circumstances Grissel Steevens, who seems to have worked much among the poor, determined that she would give effect to her brother's charitable intention during her own lifetime. Accordingly, on July 11th, 1717, she signed an indenture by which she gave the sum of £2,000 to certain trustees " in order that they should purchase ground and proceed to build the hospital designed by her late brother."

Among these trustees were four physicians: Thomas Molyneux, Robert Griffith, Edward Worth, and Richard Helsham. There was one surgeon, Thomas Proby, the Chirurgeon-General. Captain Thomas Burgh, the architect, was also one of the trustees.

On August 14th, 1717, the trustees met for the first time, at the palace of the Archbishop of Dublin, and resolved to purchase from Sir Samuel Cooke the ground on which the hospital at present stands. The building of the hospital was started in 1720 under the supervision and according to the plans of Captain Thomas Burgh. The work proceeded slowly, being carried on by direct labour without any contract; and it was not until July 23rd, 1733, that the patients were first

admitted. Madame Steevens took a direct personal interest in the work, and from time to time made considerable gifts of money to the trustees. After the completion of the hospital she lived there till her death on St. Patrick's Day, 1747, and was subsequently buried in a vault in the hospital chapel.

For the past 185 years the building designed by Captain Thomas Burgh, and built under the supervision of the trustees, has afforded shelter and maintenance to " such sick and wounded persons whose distempers and wounds are curable." It is to-day the oldest hospital building in our city, yet in structural arrangement and in suitability for its purpose it is not surpassed by any of its more modern competitors.

Dr. Edward Worth, who has been mentioned as one of the trustees nominated by Madame Steevens, came from a family which, though English in origin, had long been settled in Ireland. The Worth family, of Tytherington and Worth in Chester, had been known there for many centuries. The Rev. James Worth, of Newmarket, County Cork, is said to have been a son of Jasper Worth, of Tytherington, but the evidence is not conclusive. A son of this James Worth, Edward, was consecrated Bishop of Killaloe in January, 1660-1. The Bishop died in 1669, leaving two sons, William and John, the former of whom became second Baron of the Court of Exchequer in the reign of Charles II., and the latter Dean of St. Patrick's Cathedral. The Dean had two sons, Michael and Edward, who were educated at Merton College, Oxford; and it is to this Edward Worth that we owe the Worth Library.

Our founder entered at Merton College, Oxford, on St. Luke's Day, 1693, at the age of fifteen years. He left Oxford without taking a degree, or at least an arts degree is not recorded for him in the Oxford Rolls. After he left Oxford, he studied medicine abroad, and took the degree of M.D. at Utrecht, his thesis *Commentarius in magni Hippocratis Lib. I. Aphorismi XXII.*, being published in quarto at Utrecht in 1701. He then returned to Dublin, and at the Summer Commencements in 1702 was granted the degree of M.D. by the University of Dublin (" Ad eund. Ultraject "), and in June, 1706, was incorporated at Oxford on his Dublin degree. On April 24th, 1710, he was elected a Fellow of the King and Queen's College of Physicians. In his early career in Dublin, probably on account of his politics, he seems to have incurred

the anger of Dean Swift, who treats him rather severely under the name of " Sooterkin " in *The Swan Tripe Club*, published in 1706. Swift describes him as " a lazy modish son of melancholy spleen," and accused him of atheism when he said—

> Well may the wretch a Providence disown
> Who thinks no wisdom brighter than his own.

We have little information regarding Edward Worth's life either in private or in his professional capacity; but we believe that he attained considerable reputation as a physician, and hear of him having Primate Lindsay as his patient. He was elected President of the College of Physicians, but he was absolved from serving in that capacity on payment of a fine. He had some disagreement with his colleagues in the College, and for several years he paid fines rather than attend the meetings of the College. What the matter in dispute was we do not know; but an attempt at reconciliation made by Dr. Cummins, at the instigation of the College, was not successful.

As we have seen, Edward Worth was one of the trustees named by Madame Steevens for the building of the hospital, and in 1730 he was named one of the Governors in the Act of Parliament incorporating the hospital. From the first he took great interest in its welfare, and subscribed £30 to the fund for its completion. He died just before the hospital was opened for the reception of patients, and was buried in St. Patrick's Cathedral on February 28th, 1732-3.

He made his will on November 11th, 1723, and executed a codicil to it on November 5th, 1729. In the latter he speaks of his long sickness, and leaves to Mary Bryan, as a reward for her long attendance on him, his bed " and the furniture of the room where I lye. " In his will he bequeathed a sum of £2,000 to Merton College, Oxford, for the endowment of the post-masters of that College and for other purposes. This legacy led to considerable litigation in Chancery, but eventually the College received from it a sum of £6,612 2s. 7d., of which £5,000 was laid out in the purchase of Bradley Farm, near Oxford. The College is still in possession of this farm, which brings in a rent of £200 a year, which is less than half the rent paid forty years ago. This benefaction is now merged in the general corporate property of the College.

Merton College has reason to remember with gratitude her generous son.

While generous to Merton College, Worth was even more generous to Steevens' Hospital. He left to the hospital for general purposes a sum of £1,000. He further left all his books "except the English books in the glass case of my present study, hereafter to be otherwise devised, and likewise those which did belong to my late father, and are now at Rathfarnham." The books left to the hospital were to be for the "use, benefit, and behoof of the physician and surgeon of the time being," but were not to be removed from the room in which they were appointed to be kept. Three catalogues of the books were to be made—one to be kept chained in the library of the hospital; one in the library belonging to the college of Dublin; and the other in the public library at St. Sepulchre's. In order that the library should not be any charge to the hospital, "and thereby deprive the poor of anything which would otherwise go to their relief," certain of his father's books which were at Rathfarnham were to be sold, and the money paid to the Governors of the hospital to defray the expense of fitting up the Library. If, however, his trustee paid a sum of £100 to the Governors of the hospital, the books mentioned need not be sold, but were to become his property. His executor adopted this latter course, and these books, about 1,000 in number, were subsequently in 1742 bequeathed to the Library of Trinity College. Of the £100 to be paid to the Governors of the hospital £30 was to be paid to "some learned deserving person of the College of Dublin," "who shall digest and place the said books in order," and £20 to "some able clerk who shall transcribe the catalogue into three large books fairly written and ingrossed." The remainder of the £100 was to be laid out in "fitting and preparing the room with shelves and and other conveniencys for the reception of the said books, and with chains as aforesaid." The English books in the glass case he left to Clotilda Lady Eustace; and his "three marble bustos or heads" to his kinsman Mr. Tynte, "hoping, nevertheless, that he will think them after his death a proper ornament for the room in which my books shall be placed in the hospital." His kinsman disappointed him in this hope. His beloved kinsman and namesake,

Edward Worth, eldest son of Baron Worth, was named sole executor to the will.

Edward Worth lost no time in discharging the obligations placed on him by his cousin's will. A statement of the bequest to the hospital was made to the Governors on March 12th; and on July 22nd the treasurer reported that he had received from Edward Worth the money left to the hospital by the doctor. In an account book preserved in the hospital we find that on April 14th, 1733, George Stewart, carpenter, was paid the sum of £4 16s. for twelve whole deal boxes for Dr. Worth's books, and £2 8s. for two large doors " to secure ye room where Dr. Worth's books are to lie." On May 3rd, 1733, there is the following item: " paid carriage in full for Dr. Worth's books, £2 5s. 6d."; and on July 2nd, " contingencies in Warbourgh's Street about Dr. Worth's books, 17/8."

Although the books were delivered so soon after the doctor's death, there was a good deal of delay in getting the Library fitted up to receive them. On January 14th, 1733/4, there is a minute of the Board stating that the books " do greatly suffer by their not being taken out of the boxes and aired." The members of the Committee reported that they did not consider it prudent to meddle with them " before a catalogue be made." The Registrar was ordered to wait on Mr. Worth " to know whom he will name to take a catalogue of them." We are not quite certain who was " the learned deserving person " who did " digest and place the said books in order "; but in 1736 one Crowe was paid for transcribing one catalogue, £10 10s. The following receipt is also preserved: " Recd from the Rt. Honourable the Governors of Doct. Stephens Hospital by the hands of Mr. George Challoner the sum of twenty-four pounds twelve shillings and three pence, being so much money to me paid for two transcripts of Dr. Worth's catalogue. May ye 10 1735. James King." There is also a record of 13s. paid to Mr. Lambe for binding the catalogue.

On March 5th, 1733/4, Edward Worth was elected a Governor of the Hospital, and he at once became the moving spirit in getting the Library put in order. On August 22nd, 1735, it was decided to hold the meetings of the Governors in the committee room while the books were being put in their

places in the Library; and the steward was given the care of the Library during that time.

In September, October, and December, 1736, the hospital accounts contain the following items for work done in the Library:—

September 26th, Alderman Humphrey French, Ironmonger			£5	2	10
October 9th, John Seymor, painter.					
Library, 171 yds. twice painted at 5d.	£3	11	3		
61 once painted at 2½	0	12	3½		
			4	3	11½
October 1st, Hugh Wilson, carpenter. Work in Library ...			81	0	11½
December 1st, Francis Godfrey, glazer. Work in Library ...			6	7	10½

In addition to these sums Edward Worth himself paid £35 18s. towards finishing the Library, and presented the portrait of Dr. Worth, which was valued at £23. These payments included £7 1s. 6d. for "glazing eight doors for the book presses in the Library"; "For the columns and entablature in the Library where Dr. Worth's picture hangs £8"; for four hinges and three pair of "hinges with double joints and smooth fild," £2 5s. 6d. One pair of "double-jointed hinges smooth fild" cost 6s. 6d. The brass bosses for the doors cost two pence halfpenny each, and the "scutcheons for ye locks," two pence each. Some of these "scutcheons" and "bosses" still remain, though disguised by paint.

On July 24th, 1742, a Committee of the Governors was appointed "for putting the books in order, and to consider how to make the same more useful." On September 17th an order was made that "the panelling of the west side of the Library be taken down and converted into presses for the classing of the books." This order can refer only to the panelling above the glazed presses; and it is probable that the small presses that are now there were made at that time. Since 1742 the Library has remained practically without change, and much of the old curved glass is to be seen in the press doors.

The Library as it exists to-day is chiefly interesting as the collection of books, practically intact, made by a cultured

physician who was a citizen of Dublin during the first thirty years of the eighteenth century. In examining this collection we can form some estimate of the tasts of the collector, and indirectly of the taste of those with whom he lived.

The Library contains about four thousand five hundred volumes, the majority of which were in the possession of Edward Worth. Since it has come into the possession of the hospital there have been but few books added, the only important addition being some eighty volumes of the Public Record series, published in pursuance of a resolution of the House of Commons dated July 22nd, 1800. These volumes were presented to the hospital by the Government, and bear the imprint on the verso of the title-page, " This book is to be perpetually preserved in and for the use of Steevens' Hospital, Dublin."

The room in which the Library is housed measures twenty-eight by twenty-two feet, and is lighted by three windows, which face towards the east. The fire-place, over which hangs the portrait of Dr. Worth, is on the north side, and there are two doors, one on the west side in the south-west corner, and the other on the north side in the north-east corner. Round this room are arranged presses with glass doors. The six presses on the west and south sides respectively measure eight by four feet. On the east side, between the windows, there are two presses of similar size, and in addition one two-thirds, and four one-third of this size. On the north side there is one press of the full size, one two-thirds, and one one-third of this size. In the panelling above each of the larger presses are small presses with wooden doors measuring two feet by two feet seven inches, thus making in all fifty-one presses for the books. The glazed presses are lettered from A to X, and the shelves of each are numbered from below upwards by brass-headed nails in the front edge of each shelf. The smaller presses above take their lettering from those on which they rest, and with them their shelf numbering is continuous. Thus we have " A," " A first part above," " A second part above," and so on. The books on each shelf are numbered from the opening of the door towards the hinge. On the fly-leaf of each book is written the press letter, the shelf number, and the number of the book on the shelf, and in the catalogue there is a similar entry opposite each book. It is thus quite simple to find any book in the

Library once its place in the catalogue has been found. If, for example, one wants the *De Consolatione Philosophiae*, 1487, one finds in the catalogue under the author's name Boethius, the book with the place G 4, 21. This book will be found in press G on the fourth shelf from the bottom, and is the twenty-first book on that shelf counting from the opening of the press. The arrangement of the books in the upper presses has had to be changed, as the hanging of the pictures has prevented ready access to some of these presses.

The books are grouped roughly in the presses according to subjects. Thus on the west side we have medicine, surgery, chemistry, botany, and pure and applied mathematics. On the south side are collected history, topography, antiquities, and books of reference. On the east side we have the ancient classics, and on the north theology and some modern literature. It must be understood that this grouping is very general, but, on the whole, it is excellent.

From the subjects mentioned it will be quite evident that Dr. Worth was very catholic in his tastes as a collector, and practically all departments of literature are represented in his collection. If one might hazard a guess, one would say that he started collecting works on medicine for the purpose of study; from this his sympathies gradually extended from the subject to the authors, and from them to those with whom they lived; and later on the books came to be loved for their own sakes. He became a true bibliophile.

The medical part of the Library is fairly representative, not only of the medicine of the time, but also of ancient medicine; and we find among the books many different editions of the same author extending from the fifteenth to the eighteenth entury. He seems to have had a particular partiality for early editions of the ancient classics, of which there are many first editions in the Library. The presses of Aldus, Colinæus, Stephanus, Turnebus, and Elzevir are all well represented by excellent copies of important works. There are some seventy-seven works from the Aldine presses, thirteen of which were printed before the year 1500. There are fifty-nine volumes of the " Respublicæ apud Elzeveir," enclosed in a wooden case shaped like a folio book, measuring twenty-two and a half by fifteen and a half inches. This box is lacquered in black, and elaborately gilt on the sides and back, and closed with brass clasps.

There are in all in the Library twenty-one volumes printed before 1500, thirteen of which are from the press of Aldus. These include an excellent copy of the Aristotle, in five volumes, 1495-1498; Dioscorides, 1499; Iamblicus, 1497; Aristophanes, 1498; Politianus, 1498; Epistolæ Græci, 1499, and the Dictionarum Græcum, 1497. Besides these there are the following:—Boethius De Consolatione Philosophiae, Louvain, 1487; Bernard de Gordon, Lilium Medicinæ, Ferrare, 1486; Isocrates, Milan, 1493; Sebastian Brant, Stultifera Navis Jo. Bergman de Olpe, 1497; Vitruvius De Architectura, Venice, 1497; Nicholas Perottus, Venice, 1497, and the Etymologicum Magnum of Zacharias Calliertes, 1499. This last book, which is scarce, is in splendid condition and binding.

English literature is poorly represented in the Library, probably because the majority of Worth's English books were contained " in the glass case " which he bequeathed to " Clotilda Lady Eustace." The folio Shakespeare mentioned in the catalogue appears never to have been in the Library, and there is not any place assigned to it in the catalogue. There is an imperfect copy of the first folio of Chaucer's works published in London in 1523. There are few books relating to Ireland, and the majority of those present are not of the first importance. There are only two or three volumes of manuscripts, none of which are of great interest.

On the whole, the books are in excellent condition, and many of the bindings are beautiful examples of Dublin work. Unfortunately we have not been able to trace the name of the binder that Worth employed, though possibly that might be done by a careful examination of the end papers. There is an interesting collection of catalogues of English, Irish, and foreign book sales, at many of which Dr. Worth purchased books. Some of these books can be identified in the Library.

The Library catalogue consists of two folio volumes measuring eighteen and three quarters by thirteen inches, and bound in rough calf. The entries, made under the head of authors, in alphabetical order, are written in a clear, large hand on the recto of each leaf, with three columns at the foredge for the " Clas. Tab. Num.," or the press, shelf, and number on the shelf. The copies of the catalogue preserved

in Trinity College and in Marsh's library are each in one volume, and do not contain the shelf numbers of the books.

Besides the books there are preserved in the Library a number of interesting papers connected with the early history of the hospital. We still possess the earliest minute books of the meetings of the Governors, as well as many of the actual bills for the material used in the building of the hospital.

Above the door in the south-west corner is the following legend, probably the composition of Richard Helsham, Swift's physician:—

Ægris saucliisque sanandis,
Ric^dus^ Steevens M:D. reditus,
Gris^da^ soror superstes aedes hasce,
Dono dedere,
Edvardus Worth archiater
Bibliothecam quam vides
Eruditam, nitidam, perpolitam.

THE DRUG HABIT IN THE UNITED STATES.

It has been decided by the Congress of the United States that a drastic anti-narcotic law must be enforced to check the habitual use of morphine, cocaine, heroin, and preparations containing other narcotic drugs. The drug habit had increased to such an alarming extent that, a special Treasury Investigating Committee having been appointed, a partial report on the number of drug addicts actually under physician's treatment has been made. It is estimated that at least 1,500,000 persons in the United States are drug addicts, of whom 1,000,000 are known as such in their communities, and the balance are secret drug users. Full reports are expected to show 200,000 users within the former draft ages of twenty-one and thirty-one in New York alone. In New York City 8,000 have already been tabulated. The investigation also showed that thousands of drafted men have been dismissed from military camps after it was found they were drug addicts, and that this number included many who systematically developed the habit after being drafted, in order to insure dismissal. This condition is one reason given for the urgency of immediate remedial legislation.—*The Canadian Medical Association Journal*, January, 1919, page 76.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

President—Sir John Moore, M.D. Dubl., F.R.C.P.I.
General Secretary—J. A. Scott, M.D., F.R.C.S.I.

SECTION OF STATE MEDICINE.

President—Sir William Thompson, M.D., F.R.C.P.I.
Sectional Secretary—Ella G. A. Webb, M.D.

Friday, January 17, 1919.

Half a Century's Review of Marriages and Births in Ireland.

The President of the Section gave an Address under the above heading. The information supplied for the purpose of the review contained in the Address was condensed into ten quinquennial periods, and instead of actual numbers only proportions to the population were given. In addition, the tables were converted into diagrams shown on slides, so that the subject could be followed more readily.

[This Address is printed in full at page 101 of this number of the Journal.]

Dr. Hennessy read a paper on "The Ministries of Health Bill."

[This communication was published in full in the number of the Journal for February, 1919, Vol. 147, page 49.]

The President of the Academy congratulated the Section on the very admirable and comprehensive paper read by Dr. Hennessy. From his personal knowledge he could corroborate all that the author had said as to the unsatisfactory condition of the make-believe sanitary organisation in Ireland. The permissive nature of the Public Health Acts had wrought much mischief in this country, and it was an intolerable evil that no material chance of promotion was offered to the Dispensary Medical Officers at large, who spent their lives in isolated districts for a wholly inadequate remuneration. They were also without the protection of independent Medical Superintendent Officers of Health, such as were contemplated in section 11 of the Public Health (Ireland) Act of 1878.

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, January 25, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, January 25, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 20.8 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, January 25, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 20.8 and 20.9; Dublin Registration Area, 23.0 and 22.4; Dublin City, 23.5 and 23.7; Belfast, 18.9 and 18.1; Cork, 21.8 and 19.2; Londonderry, 29.3 and 26.4; Limerick, 23.0 and 25.0; and Waterford, 13.3 and 25.2.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, January 25, 1919, were equal to an annual rate of 0.7 per 1,000. Among the 145 deaths from all causes in Belfast were 1 from diphtheria and 2 from diarrhœa and enteritis in children under 2 years. Included in the 32 deaths from all causes for Cork are 1 from scarlet fever and 2 from diarrhœa and enteritis of children under 2 years, and of the 23 deaths from all causes for Londonderry 1 is from typhus and 1 from whooping-cough.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended January 25, 1919, amounted to 197—104 boys and 93 girls, and the deaths to 193—92 males and 101 females

DEATHS.

The deaths registered, omitting the deaths (numbering 14) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 23.0 per 1,000 of the population. The rate for all deaths registered during the four weeks of 1919 ended January 25 was 24.4, while in the corresponding period of the preceding ten years, 1909-1918, it had been 25.2.

The 179 deaths appertaining to the Area included 1 from scarlet fever, 1 from diphtheria, and 3 from diarrhœa and enteritis of children under 2 years. Six deaths from influenza were registered. In the three preceding weeks deaths from influenza in the Registration Area had numbered 10, 6, and 10 respectively; and deaths from diarrhœal diseases, 1, 2, and 3.

Deaths attributed to pneumonia were 15 (comprising 10 from broncho-pneumonia, 1 from lobar pneumonia, and 4 from pneumonia, type not distinguished), as against 22, 21, and 10 in the three weeks preceding.

Tuberculosis caused 32 deaths as against 27, 24, and 26, respectively in the three weeks preceding. Of the 32 deaths ascribed to tuberculosis, 21 were referred to pulmonary tuberculosis, 4 to tubercular meningitis, and 7 to other forms of tuberculosis.

Ten deaths were caused by cancer, 14 by organic diseases of the heart, and 21 by bronchitis.

Among the deaths of infants under one year old, 4 were ascribed to convulsions, 6 to bronchitis, 4 to broncho-pneumonia, 2 to diarrhœa and enteritis, 3 to premature birth, 1 to congenital malformation, and 2 to congenital debility.

Fifty-one of the deaths registered during the week appertaining to the Area were of children under 5 years of age, 31 being of infants under one year, of whom 11 were under one month old. Forty-five deaths of persons aged 65 and upwards were registered, including 32 deaths of persons of 70 years or upwards.

Of the 179 recorded deaths 70 occurred in hospitals and other public institutions.

There were 5 violent deaths, 3 having been caused by burns, one of the victims being a child 3 years of age.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended January 25, 1919, and the cases under treatment at its close respectively, were as follow:—Enteric fever, 3 and 11; measles, 5 and 8; scarlet fever, 13 and 46 (exclusive of 16 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 1 and 7. Six cases of pneumonia were admitted during the week, and 34 remained under treatment at its close. Of the deaths in hospital recorded during the week, 1 was from enteric, 1 from scarlet fever, and 1 from diphtheria.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, January 25, 1919, in 96 large English towns (including London, in which the rate was 14.1) was equal to an average annual death-rate of 15.0 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 18.1 per 1,000, the rate for Glasgow being 16.4, and that for Edinburgh 21.4.

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of January, 1919.

Mean Height of Barometer	29.669 inches.
Maximal Height of Barometer (24th, at 9 a.m.)	30.502 ,,
Minimal Height of Barometer (7th, at 6 a.m.)	28.450 ,,
Mean Dry-bulb Temperature,	39.2°.
Mean Wet-bulb Temperature	37.8°.
Mean Dew-point Temperature	36.2°.
Mean Elastic Force (Tension) of Aqueous Vapour,	0.214 inch.
Mean Humidity	88.9 per cent.
Highest Temperature in Shade (on 14th)	53.0°.
Lowest Temperature in Shade (on 28th)	30.9°.
Lowest Temperature on Grass (Radiation) (29th)	27.2°.
Mean Amount of Cloud	68.7 per cent.
Rainfall (on 25 days)	2.642 inches.
Greatest Daily Rainfall (on 4th)	0.340 inch.
General Directions of Wind	S.W.,W.,W.S.W.

Remarks.

The opening month of 1919 proved unsettled, dull, cold, damp, and rainy, with but a limited thermometric range, but a very large range in atmospheric pressure—namely, 2.052 inches. The barometer was persistently low during the first 10 or 12 days, and unusually low on the mornings of the 7th (28.450 inches) and 9th (28.490 inches). On the other hand readings were especially high about the 22nd, 23rd, and 24th, and again during the last 3 days of the month, when an anti-cyclone stretched westward from Norway to the Faroe Islands, throwing a cold easterly current upon the British Isles and France. During the latter period falls of sleet, hail and snow were frequent, and a sharp frost spread from Holland to the east, south-east, and south of England on the 30th.

The Dublin Mountains were covered with snow during the last few days of the month.

In Dublin the arithmetical mean temperature (40.2°) was below the average (41.7°) by 1.5° ; the mean dry-bulb readings at 9 a.m. and 9 p.m. were 39.2°. In the fifty years ending with 1915, January was coldest in 1881 (M. T. 33.2°), and warmest in 1898 (M. T. 47.8°). In 1916 the M.T. was 47.7° ; in 1917, it was 38.0°, and in 1918, 42.2°.

The mean height of the barometer was 29.669 inches, or 0.205 inch below the corrected average value for January—namely, 29.874 inches. The mercury rose to 30.502 inches at 9 a.m. of the 24th, and fell to 28.450 inches at 6 a.m. of the 7th. The observed range of atmospheric pressure was, therefore, 2.052 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 39.2°, or 6.1° below the value for December, 1918. Using the formula, *Mean Temp.* = *Min.* + (*Max.* — *Min.*) × .52, the M. T. becomes 40.4°, compared with a thirty-five years' (1871–1905) average of 41.9°. The arithmetical mean of the maximal and minimal readings was 40.2°, compared with a thirty-five years' average of 41.7°. On the 14th the thermometer in the screen rose to 53.0°—wind, S.W. ; on the 28th the temperature fell to 30.9°—wind, W.N.W. The minimum on the grass was 27.2°, on the 29th.

The rainfall was 2.642 inches, distributed over 25 days,

Of this amount 0.340 inch fell on the 4th. The average rainfall for January in the thirty-five years, 1871–1905, inclusive, was 2.210 inches, and the average number of rain-days was 18. The rainfall, therefore, was materially above the average, while the rain-days were much above it. The record rainfall for January was in 1895—namely, 5.711 inches on 24 days. In 1913, also, 5.576 inches fell on 21 days. In 1876, only 0.406 inch was measured on but 9 days. In 1907, only 0.428 inch fell on but 9 days. In 1918, 1.600 inches fell on 15 days.

The atmosphere was foggy on the 8th, 14th, 18th, 19th, 21st, 22nd, and 23rd. High winds were noted on 10 days, but reached the force (8) or a fresh gale only on the 1st, 7th, and 9th. Hail fell on the 4th, 29th, and 31st ; snow on the 4th, 27th, 29th, and 31st. A lunar corona was seen on the 10th and 12th ; a solar halo on the 13th. Lightning was seen at 6 p.m. of the 10th. Temperature reached or exceeded 50° in the screen on 2 days ; while it fell to 32° in the screen on 5 days. The grass minimum was 32° or less on 16 nights. On the 4th the maximal temperature in the screen was only 36.8°. A very similar reading, 37.2°, occurred on the 27th. These and the 28th were the three coldest days of the month, their mean temperature being only 35.5°.

Mr. C. M. Connolly reports that at the Normal Climatological Station in Trinity College, Dublin, the mean height of the barometer was 29.680 inches, the range of atmospheric pressure being from 28.523 inches at 9 p.m. of the 6th to 30.507 inches at 9 a.m. of the 24th. The mean value of the readings of the dry-bulb thermometer at 9 a.m. and 9 p.m., was 40.5°. The arithmetical mean of the daily maximal and minimal temperatures was 41.0°. The screened thermometers rose to 54° on the 14th, and fell to 30° on the 28th. On the 11th the grass minimum was (19°?). Rain fell on 23 days to the amount of 2.47 inches, the greatest fall in 24 hours being 0.33 inch on the 8th. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 40.5 hours, of which 4.7 hours occurred on the 17th. The mean daily sunshine was 1.3 hours. The mean temperature of the soil at 9 a.m. at a depth of one foot was 41.2° ; at a depth of 4 feet it was 44.8°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data :—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin ; Mr. T. Bateman, Malahide, Co. Dublin ; Mr. J. Pilkington, Stirling, Clonee, Co. Meath ; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin ; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin ; Mr. F. Dudley Joynt, Donnybrook, Dublin ; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin ; Dr. Arthur S. Goff, Dundrum, Co. Dublin ; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin ; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow ; Mrs. Sydney O'Sullivan, Auburn, Greystones ; Dr. F. O'B. Kennedy, Royal National Hospital, Newcastle, Co. Wicklow ; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare ; Mrs. E. Davis, Castleconnell, Co. Limerick ; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 2.89 inches, on 26 days. Average, 2.37 inches on 18 days. Maximum in 24 hours, 0.29 inch on 13th. In January, 1913, 5.08 inches fell ; in January, 1907, only 0.59 inch of rain was recorded. Maximal temperature in shade, 51.1° on 1st ; minimum, 29.1° on 7th and 26th.

Malahide.—[No return.]

Clonee.—Rainfall, 4.25 inches, on 28 days. Maximum, 0.50 inch on 4th.

Phœnix Park.—Rainfall, 2.91 inches, on 27 days. Maximum, 0.39 inch on 6th. Total amount of sunshine was 59.4 hours, the most being 6.4 hours on 17th.

Cheeverstown.—[No return.]

Donnybrook.—Rainfall, 2.570 inches, on 27 days. Maximum, 0.400 inch on 4th.

Ranelagh—

Mean corrected Height of Barometer -	[Record incomplete.]
Highest corrected Reading (24th, 9 hours) -	30.49 inches.
Lowest corrected Reading (7th, 9 hours) -	28.52 ,,
Mean Dry-bulb Temperature - - -	39.2°.
Mean Wet-bulb Temperature - - -	37.9°.
Mean Vapour Pressure - - -	0.214 inch.

Mean Humidity	89 per cent.
Mean Maximal Temperature	44.7°.
Mean Minimal Temperature	35.1°.
Arithmetical Mean Temperature	39.9°.
Highest Temperature in Screen (1st, 14th)	53°.
Lowest Temperature in Screen (1st, 19th, 22nd, 23rd, 28th)	30°.
Lowest Temperature on Grass (18th)	17°.
Nights of Ground Frost	18.
Rainfall (on 23 days)	2.81 inches.
Greatest Daily Rainfall (4th)	0.44 inch.
Mean Amount of Cloud	75.5 per cent.
Days of Clear Sky	3.
Days of Overcast Sky	18.
General Directions of Wind	Calm, W., S.W.

Remarks.—A cold, overcast, unfavourable month. Rain-days above average, and wind-force below. Maximum temperature below 40° on three days.

Dundrum.—Rainfall, 2.88 inches, on 26 days. Maximum, 0.57 inch on 6th. Mean shade temperature, 40.6°; maximum, 58° on 11th; minimum, 30° on 18th and 27th.

Killiney.—Rainfall, 2.33 inches on 19 days. Maximum, 0.69 inch on 4th. Average, at Cloncevin, Killiney (24 years, 1885–1908), 2.310 inches on 16.7 days.

Greystones (Rathdown House).—Rainfall, 4.49 inches on 26 days. Maximum, 1.43 inches on 4th, in the form of hail, sleet, and snow.

Greystones (Auburn).—Rainfall, 3.37 inches on 23 days. Maximum, 0.94 inch on 3rd.

Newcastle.—Rainfall, 4.04 inches on 25 days. Maximum, 0.64 inch on 4th. Mean temperature, 39.4°; maximum, 51° on 1st; minimum, 31° on 27th; mean maximum, 43.4°; mean minimum, 35.3°.

Ennistymon.—Rainfall, 6.66 inches on 22 days. Maximum, 0.79 inch on 13th.

Castleconnell.—Rainfall, 4.25 inches on 21 days. Maximum, 0.50 inch on 8th.

Dunmanway.—Rainfall, 6.44 inches on 24 days. Maxi-

mum, 0.84 inch on 13th. Besides this, 0.80 inch fell on 8th and 0.76 inch on 6th. The observer writes :—" A damp, cold month, with frequent frosts, but none very severe. No snow. Stormy at the beginning of the month. Colder and drier towards its close. There was a brilliant aurora borealis on the night of the 3rd. I could read my watch by its light at 9 p.m."

PERISCOPE.

GAUZE SPONGE EXPELLED SPONTANEOUSLY FROM THE URINARY BLADDER.

Dr. G. Paul Laroque, Richmond, Va., reported the following case to the Southern Surgical Association in December, 1918:—Five years ago a woman was operated on and was told that the appendix and left ovary were removed and the uterus suspended. No drainage was employed. She remained perfectly well for five years and was then seized suddenly with agonising bladder tenesmus, spasmodic incontinence of urine, and an enormous quantity of foul-smelling pus. Roentgen examination for stone was negative; there were no clinical evidences on examination. Cystostomy was not attempted on account of the violence of pain and the inability to hold water in the bladder. The body temperature varied from normal to 101 F.; the pulse varied from normal to 100. Vaginal examination detected a small mass in the right fornix. There were no menstrual symptoms. On two occasions the patient had retention of urine, and the catheter withdrew on the first occasion a quart of foul-smelling pus containing urine, and a week later, when an attempt was made to catheterise her again, a piece of gauze was discovered in the urethra. This was pulled out and proved to be a surgical gauze sponge about 2 inches wide and 10 inches long. The symptoms immediately subsided. In a week's time she was well, cystostomy revealing a very small, almost completely healed fistula in the right side of the bladder. The mass could no longer be felt in the pelvis. In a week the patient left the hospital, and has remained perfectly well.—*The Journal of the American Medical Association*, January 18, 1919, page 218.

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PART I.

ORIGINAL COMMUNICATIONS.

ART. IX.—*The Special Supports of the Uterus.*[a] By A. FRANCIS DIXON, M.B., Sc.D.; University Professor of Anatomy, Trinity College, Dublin.

IN asking the Obstetrical Section of the Academy to consider the question of the supports of the uterus I am anxious to learn the views of those who have opportunities of observing this organ in the living subject and of exposing and cutting through the tissues related to the pelvic organs in the live state.

It is not possible to determine the meaning or functions of the various tissues within the pelvis by an examination of their structure, connexions, and relationships in the dead subject. Such knowledge as may be obtained by dissection must be supplemented by information derived by clinicians and surgeons, and by observations on animals, if we are to arrive at a satisfactory understanding of these complicated structures.

This, after all, is what we might expect. What should we know of the movements and functions of the tongue if our knowledge was derived merely from examination and

[a] Read before the Section of Obstetrics in the Royal Academy of Medicine in Ireland on Friday, February 14, 1919. [For the discussion on this paper see page 183.]

dissection after death, and were it not possible to observe its alterations in form and its movements during life?

In the various writings dealing with the support of the pelvic organs, our attention is directed, in addition to the bony pelvis—(1) to certain muscles, (2) to layers or sheets of fascia, and to strands of connective tissue, often described as ligaments, and (3) to the peritoneum. Various authors attribute more or less importance to each of these.

(1) As to the importance of the pelvic diaphragm, formed by the levator ani muscle, there is however almost complete agreement, although as to the actual manner in which this muscle affords support to the pelvic organs there is some divergence of view. The anatomical arrangement of the levator ani is now, I believe, satisfactorily understood, and its important function, not merely as a support and an elevator of the pelvic floor, but also as a sphincter of the rectum, is generally acknowledged.

Like the other muscles, which help to bound the abdominal and pelvic cavities, the levator ani muscle is covered by layers of fascia, which may be seen upon both its pelvic and perineal surfaces. These investing layers of fascia have probably little to do with the amount of support which the muscle affords to the pelvic viscera.

Other muscles also help to line the pelvic cavity—such as the obturator internus, the coccygeus and the pyriformis, and these are also covered on their pelvic surfaces by investing layers of fascia comparable to the layer which lies on the pelvic surface of the levator ani. The share taken by these muscles in the support of the pelvic organs is less direct than that taken by the levator ani.

(2) Inside the muscles and their investing fascial layers we have a stratum of, for the most part, loosely arranged connective tissue, in which lie the vessels and nerves of the pelvic organs. This tissue is on the same plane as, and is continuous with, the subperitoneal abdominal tissue, which in varying thickness surrounds all the abdominal contents and contains the vessels and nerves for them. The alimentary canal, the liver, the spleen, the pancreas,

and the kidney are all placed in this subperitoneal tissue. The loose subperitoneal tissue of the abdomen contains not merely the viscera, their blood-vessels, lymphatics and nerves, but in certain places collections of smooth muscle fibres, such as the suspensory muscle of the duodenum, and also strands, or sheets, of connective tissue, such as the "renal fascia." The subperitoneal tissue of the pelvis contains similar structures, and in certain situations contains much fibrous tissue, or much smooth muscle. The pelvic subperitoneal tissue lies on a definite morphological plane, and includes all the tissue which lies beneath the peritoneum, between the lining fascia of the pelvis and the pelvic viscera, as well as between the pelvic viscera themselves. It is to be noted that the pelvic subperitoneal tissue is not only continued upwards beneath the peritoneum into the abdomen, but also has prolongations along the vessels which pass out through the obturator foramen and the ischiadic foramina. Further, except in those places where they are adherent, or structurally continuous with one another, the subperitoneal tissue surrounds the various pelvic organs, and forms the so-called "visceral layers of the pelvic fascia."

(3) The *peritoneum* which lines the peritoneal cavity of the pelvis covers the upper parts of the pelvic organs and the subperitoneal tissue. It forms on each side the conspicuous broad ligament and the sacro-genital fold—or fold of Douglas—both of which reach the uterus. In the middle line it covers the upper part of the rectum, lines the pouch of Douglas, covers the chief part of the uterus, lines the chink between the uterus and the upper surface of the bladder, and covers the upper surface of the bladder. On each side it is reflected to reach the lateral pelvic wall lining shallow fossæ—the para-rectal and the para-vesical fossæ.

Peritoneal folds, like the broad ligament and the sacro-genital folds, contain, between their layers, parts of the general subperitoneal tissue, in which may be blood-vessels, lymphatics, nerves, areolar tissue, loose or densely-

packed fibrous strands, or smooth muscle fibres. It is probable that the peritoneum has but a small, if any, share in the support of the uterus.

The special supports of the uterus are the structures in the subperitoneal tissue. Some support, in addition to that furnished by the levator ani, is necessary to prevent the uterus being thrust downwards or telescoped into the vagina by intra-abdominal pressure. The support is mainly applied at the lateral aspect of the cervix uteri and at the lateral fornix of the vagina. Here the subperitoneal tissue is packed with smooth muscle and connective tissue fibres, which radiate outwards along with the vessels and nerves which are in this region so abundant. This dense subperitoneal tissue lies partly between the layers of the broad ligament, where they diverge as they reach the pelvic floor. The dense mass is continuous with the muscular wall of the cervix uteri and vaginal fornix, and not merely adherent to these structures, and in front of them it is continuous in the muscular wall of the lateral angle of the bladder, and forms the "urethral sheath." Very many years ago the name "Parametrium" was given to this tissue, but it must be recognised that it lies not merely at the side of the cervix uteri, but also at the side of the fornix vaginæ and at the lateral angle of the bladder. Much of the smooth muscle which it contains is derived from, and is continuous with, the muscular walls of these viscera. The attachment of these muscle bundles renders it impossible to make a smooth dissection of the organs, and the radiating fibres may be regarded as parts of the viscera from which they spring. When the muscle bundles are traced away from their attachments to the uterus and vagina they disperse in a radiating manner. Some sweep backwards, or backwards and somewhat upwards, and lie in the anterior wall of the recto-uterine pouch, or enter the sacro-genital fold of peritoneum; others pass more laterally, or laterally and somewhat upwards, towards the side wall of the pelvis. All the muscle and connective tissue bundles become indefinite as they divide up and radiate from one

another—many of them following the course of the vessels and nerves. In a vertical section parallel to the mesial plane and passing close to the cervix a lateral cervical mass of fibres, the lateral cervical "ligament" of Mackenrodt may be distinguished and also a smaller band, which passes into the sacro-genital fold. These are not isolated, but are adherent to one another, where they spring from the uterus and vagina. Anteriorly, such a section may show that the mass of tissue is continuous with the lateral angle of the bladder through the dense mass of the uretral sheath. In young children the muscle fibre bands are very distinct, and are more easily traced than in elderly adults.

In considering the question as to how these supports act in maintaining the uterus, it is most important to recognise that they are actually continuous with, or rather parts of, the uterine and vaginal walls. Too often we regard the uterus as a hard, inert organ, pressed upon by neighbouring structures and held up, or supported, against abdominal pressure by inert fibrous bands, or fascial layers. In reality, the thick, muscular uterine coat must constantly be varying in the amount of its contraction. Waves of contraction passing over its surface have been noted in lower animals, and I presume such contractions also occur in the living human subject. Such contractions would normally pass on into the radiating muscle strands which form the lateral cervical and sacro-uterine "ligaments." In this way we may expect that the uterus may be able to make tense its connexions and supports, and possibly shift its position to some extent by traction on, or through, the smooth muscle bundles which radiate from its cervix. Similarly, a contraction passing into the smooth muscle fibres which form the round ligament may be counted upon to draw the fundus uteri forwards as the bladder empties itself. It is, therefore, suggested that in the normal living subject the uterus has not the *floppy condition* we find in the dead subject, but that it holds itself, or is held, in position by the action of the various bands of smooth muscle fibre which radiate from it. Further, that

the uterus does not merely fall forwards on the emptying bladder, but that a pull of the round ligaments accompanies this forward movement, and, similarly, that the round ligaments, although elongating, are still contracted (to a less degree, however) as the bladder fills. In this way they steady the movements of the uterus in its forward or backward movement.

The importance of the smooth muscle bundles in supporting the uterus at its neck can scarcely be exaggerated. Such tissue offers active—not merely passive—resistance to pressure, and forms a graduated and adjustable pull in the opposite direction.

Some authors have described the bulk of these strands which radiate from the cervix and traverse the subperitoneal tissue as being fibro-elastic. Probably some elastic tissue may occur, but smooth muscle is far more abundant, and I believe it is the really important tissue present. Further, as we have seen, its structural continuity with the uterine muscular wall is of the utmost importance.

Conclusion.—The special supports of the uterus are active, not passive, and are due to the bundles of smooth muscle fibre described.

ART. X.—*A Note on 500 Operation Cases from the Gynæcological Department, Mercer's Hospital, Dublin.*[a] By BETHEL SOLOMONS, M.D., F.R.C.P.I.: Gynæcologist to Mercer's Hospital, &c.

INTRODUCTION.

IN bringing forward a short report of a series of 500 operation cases I fear I have but little novel to report. It will be noted that the title of the paper is 500 operation cases, but the number of operations is well over 1,000, for an average of at least two operations was done in each case.

TECHNIQUE.

Vaginal Operations.—The bowels are well freed, the

[a] Read before the Section of Obstetrics in the Royal Academy of Medicine in Ireland on Friday, January 10, 1919. [For the discussion on this paper see page 182.]

parts are shaved and disinfected, and a vaginal douche is given the evening before operation. At the operation everything is covered with sterile leggings and towels except the part to be operated on. The extern genitals are painted with tincture of iodine, after which the vagina is douched thoroughly. In cases where the uterus is to be curetted the cervix, having been drawn downwards with a bullet forceps, is cleaned, and a probe loaded with cotton wool soaked in tincture of iodine swabs out the cervical canal; this, I believe, is a necessary procedure, and prevents the introduction of bacteria from the cervix into the uterus. No. 3 iodine catgut is used for all vaginal plastic work. Sterile gowns and gloves are worn, but I do not believe that masks are necessary when performing operations through the vagina.

Abdominal Operations.—During this series of cases I tried various solutions for skin disinfection. First, ether followed by biniodide in spirit 1/500, followed by saturated solution of picric acid. Second, McDonald's solution, consisting largely of acetone, and finally ether followed by tincture of iodine. The last is the method I use at present, and from close observation of these different methods I believe that one is as good as the other, and so long as the operator is clean and sees that his assistants are clean, the skin sterilisation is of little account provided the method employed causes skin hardening. A longitudinal mesial incision is used in all abdominal operations except in the cases of very obese patients, when the Pfannenstiel incision is found to be of the greatest benefit. The incision is always made long enough to work in comfort. The wound is closed in three layers, the peritoneum and aponeurosis being approximated by catgut, the skin either by a subcuticular stitch of 00 catgut or by Michael's clips. Two or three tension sutures of silkworm gut with rubber protective are inserted through the aponeurosis and skin; these are introduced by means of Doyen's needle. Iodine is dropped on the wound from a drop bottle, and dry sterile wipes are applied. The drop bottle plan is a great econo-

miser of iodine, as the wool which is commonly used soaks most of the drug. Any questionable tumours or curettings are examined at the Dublin University Laboratory. When the patient recovers consciousness she is encouraged to turn from one side to the other, with the idea that free movements contraindicate the possibility of embolism. If necessary, morphine sulphate gr. 1/6 is given in the first six hours. Morphine sulphate gr. ¼ is given during the night. Atropine sulphate is administered with the morphine. On the second morning following operation, a simple enema, consisting of a pint of warm soap and water with from 1 drachm to 2 drachms of liquor ammoniæ, is given; if the result is not satisfactory the enema is followed by drachm doses of sulphate of sodium until a satisfactory result is obtained. A bedrest is allowed on the fifth or sixth day. The patient gets up from bed on the tenth and leaves the hospital on the twelfth day following operation. In the case of perinæorrhaphies the period for remaining in bed is lengthened to twelve days.

Complications.—Among the post-operative complications encountered, pneumonia occurred 12 times. It assumed the form of a broncho-pneumonia, or a pseudo-broncho-pneumonia which has been described as pneumonitis, on the second day, and was possibly due to the anæsthetic (ether) which was employed in all cases. As I thought it *might* be due to chill in going to or coming from the theatre, woollen vests were ordered for all the patients. Since adopting this plan there have been no such cases, and it is difficult to say if this was a case of *post hoc* or *propter hoc*. Unfortunately, two patients died from pneumonia. One occurred after a simple Gilliam operation, and I fear that she developed this on her journey from the country in the depth of winter. The other death occurred in a woman for whom I had done an extensive operation to cure a prolapse of the uterus.

In comparing these results with those obtained in private practice I find I have never had a case of pneumonia in the latter. Probably the fewer draughts and the smaller

distance from the theatre to the ward may conduce to this result.

It is strange to record that I have never met with a case of thrombosis or embolism in my hospital practice, although I have had the misfortune to have had two cases in private patients. They were both extensive myomectomies. This might be explained by the fact that hospital patients are less afraid to move about. It is sometimes difficult to move private patients from bed. It is certainly an argument in favour of free movements and early rising. Only one patient got a thrombophlebitis in the leg, and this was a mild case following ventral suspension for fixed displacement. The leg was quite well after three months.

There were no wound infections of note except in cases of malignant disease of the cervix and in operations for conditions already septic. It is a problem in gynæcology to avoid infection in the former class of case, even when using rubber dams and other similar methods. Probably the best results are obtained by frequent changing gloves and sheets when there has been any possibility of infection.

Special Points.

Curettage.— It will be noticed in the table that I curetted the uterus in 201 patients for whom I performed some other operation, such as for the cure of displacement, myomectomy, &c. I believe this to be a logical procedure, for there is congestion of the endometrium in nearly all cases of pelvic disease. The extent of the curettage depends on the amount of the congestion or inflammation present. Either the curette can be passed over the endometrium to obtain an idea as to the extent of the disease present, or where the endometrium is found to be much thickened the operation is more radical. The operation of curettage, when done aseptically and carefully, is useful, but requires as much skill in execution as the most difficult hysterectomy. Curettage alone was performed 62 times.

Backward Displacement of the Uterus.—For this con-

dition I did a modified Gilliam operation 98 times, ventral suspension 62 times, Alexander Adams operation 34 times, and ventral fixation five times. It will be seen by these figures that I am not wedded to any single operation. The rule generally followed is, if the case is simple—*i.e.*, uncomplicated by tumours or inflammation—where the patient is not sterile or where the backward displacement is concomitant with descent of the uterus, I perform Alexander Adams operation. It gives an excellent anatomical result, but I do not believe it is suitable in sterility cases, for no matter how sure one may feel about the freedom from intra-abdominal disease, it is impossible to tell if the abdominal tubal ostia are free. In suturing the ligaments silk number 3 is used; it is more certain than catgut, and if care is taken the danger of infection is remote. In deciding whether to perform ventral suspension or Gilliam's operation I have been influenced by Howard Kelly, who has stated that he has given up the former operation, not because of his own bad results, but because of the ill results in labour as reported by others. I have never seen bad results following the operation when correctly performed, and I have attended many times patients in confinement after it. However, in the large majority of recent cases I have adopted a modification of Tod Gilliam's technique unless the ligaments are definitely weak, when ventral suspension was performed. The modification I perform may be original; it is somewhat similar to Simpson's method, and I have seen Sir W. Smyly performing a modification something like it. The abdomen having been opened by a mesial incision from the pubes, all adhesions are broken down and any adnexal abnormality is corrected. The round ligaments are then encircled by a silk stitch about one and a half inches from the uterus; this stitch is used as a guy. The aponeurosis is then held in a clip forceps at the level of the fundus; a special curved forceps is then passed under the rectal aponeurosis to the level of the intern abdominal ring, it is passed along between the layers of the broad ligament

until it arrives at the level of the guy stitch; it catches this and pulls the ligament out by it. The ligament is then stitched to the under surface of the rectal aponeurosis at its outer margin with silk. This operation gives excellent anatomical and clinical results in every way. I believe it is better than pulling the ligament through an opening in the aponeurosis, for sloughing has been reported after this. In this extraperitoneal stitching there is no danger of intestinal obstruction. It is better than tying the ligaments together, for this anchors the uterus too tightly.

Sterility.—It is altogether surprising to find that, in a series of 500 gynæcological cases, 115 were women who came for the relief of sterility. I have made a special study of this subject, and the depletion of the race which has been caused by the war makes it the most important which comes before the gynæcologist. I hope at some future date to bring before the Academy a large number of these sterility cases. I have found that a considerable proportion is due to the male. When due to the female, the chief pathological conditions present were tubal inflammation and kinks, small congenital cysts of the broad ligament, backward displacement of the uterus, and fibroid tumours. From a study of this series and of other cases I am convinced that when it is necessary to operate for sterility, and there are many which can be cured without operation, there are few cases in which it is not justifiable to open the abdomen. The procedure of dilatation of the cervix and curettage, combined with operations on the cervix, is seldom successful alone.

Prolapse.—The cure of prolapse is still a problem. New operations are described in the journals every month, some of them being most drastic procedures. There is no doubt that where the prolapse is associated with cystocele, as usually occurs, a lengthy operation is necessary if a cure is to be effected. I have nothing novel to report. When the patient has passed the menopause interposition of the uterus, with circular amputation of the cervix and anterior colporrhaphy, followed by colpoperinæorrhaphy, are per-

formed. Before the menopause, a most extensive anterior colporrhaphy with tucking up of the bladder, circular amputation of the cervix, shortening of the utero-sacral ligaments, colpoperinæorrhaphy, followed by Alexander Adams operation or some other form of uterine suspension is the choice. There is no doubt that these operations, and others, such as the comparatively recent Mayo operations, are fraught with danger; there is also no doubt that they achieve excellent results. I agree with a writer who recently wrote that we are inclined sometimes to favour distorting operations when a carefully performed plastic operation will suit the case. I certainly do not consider it justifiable to perform interposition before the menopause. In 23 cases of severe prolapse—*i.e.*, cases which required lengthy operation—I lost two patients; I shall refer to these when speaking of mortality generally.

Ovarian Tumours.—A word must be said about the pathology of ovarian tumours. It is impossible to rely even on the most skilled pathologist. A tumour reported as benign may metastasise in a few months, while the woman from whom a reported malignant tumour has been removed lives to old age. There is a great field for research on this subject.

Myomectomy and Hysterectomy.—Myomectomy has been practised in cases of sterility and before the menopause where multiple fibroids were not present. The results of myomectomy in this series have been excellent. There have been no deaths and no post-operative complications. In my private practice I met with two cases of pulmonary embolism, one of which was fatal. This danger must always be present, and recurrence of the tumour is said to occur. I am at present disposed, from my own experience and that of others, to favour hysterectomy as the treatment of choice except in the cases outlined above, and in a certain number which either refuse operation or, on account of some organic lesion, are more suited to *x*-ray treatment. Regarding hysterectomy for benign tumours, the subtotal operation is done unless where the

cervix contains fibroids, or where it is diseased. The ovaries when healthy are left *in situ*. The danger of cancer developing in the cervical stump seems to me to be far less than the increased risk of the total operation. I have never seen an ill-result following retention of the ovaries, while the constitutional advantages gained are great. In this series there are 27 subtotal and 9 total operations for benign disease, with no death. In hysterectomy for malignant disease there are 9 Wertheim operations, with 4 deaths; this is a large percentage mortality, but all the cases were very far advanced. In this type of case radium is of much value, but unfortunately radium does not cure, while a thoroughly executed evacuation of the disease has a large percentage of cures.

Special Cases.—Most of the specially interesting cases I encountered I have brought before the Academy. Among them may be mentioned an abdominal pregnancy, a fibrosarcoma of the mesentery, and a malignant tumour of the Fallopian tube. Among those not published is a case of chorion-epithelioma. This occurred in a woman of 49, an octipara, who had severe bleeding following a reputed abortion. She was sent to Mercer's Hospital, and, curettage having been performed, Dr. Wigham reported the case to be one of chorion-epithelioma. The patient was very desanguinated, and was rapidly going down-hill. A Wertheim's total hysterectomy was performed as the only chance of saving her life, but despite all stimulating treatment the blood-loss had been too great, and she died on the fourth day.

Mortality.—There were eight deaths in the 500 cases, a mortality of 1.6 per cent. Four of these followed Wertheim's hysterectomy for malignant disease. Two followed the radical operation for the cure of prolapse of the uterus. In both of these the operation performed was as laid down when speaking on this subject. They both occurred in women passed the menopause. One died of pneumonia. The other died of peritonitis. The latter was an interesting case. She had some ulceration of the cervix which

would not heal, and I determined to cut the ulcerated portion out as a preliminary to the operation. Having done this, all gloves were changed and different instruments were used. The remainder of the operation was without incident. She was quite well for a week, when she developed an abscess in the pelvis: this was opened, she rallied for a week, and then died. There was no *post-mortem*, but I attribute the death to the reason stated above. I had always avoided operating on prolapse accompanied by ulceration, but it is difficult sometimes in the case of country patients, and it seemed as though, great care being practised, a good result might be obtained.

One patient died two days after a Gilliam operation from acute pneumonia.

The eighth death was one which occurred following hopeless operation for cancer of the tube.

Conclusions.—The main conclusions arrived at from this paper are :—

1. Skin disinfection is best accomplished by some reagent which hardens the skin. Ether followed by iodine is an excellent method.

2. There is less chance of pulmonary embolism if patients are encouraged to move about freely in bed after operation. A lengthy stay in bed is inadvisable. To prevent pneumonia and pneumonitis care must be taken that patients be warmly clad going to or coming from the theatre.

3. Curettage when carefully performed is a beneficial operation.

4. Of the many operations described for the cure of backward displacement, the modification of Tod Gilliam's technique described in the paper has been found to be the best. Ventral suspension and Alexander Adams operation have their indications, and ventral fixation is satisfactory after the menopause.

5. When it is necessary to treat sterility by operation, it is justifiable to open the abdomen to examine the state of the adnexa even though there are no marked signs of

disease. Tubes of normal size with closed ostia, hydrosalpinges and very small cysts of the ovary are often discovered.

6. This paper on immediate results of operation for gynæcological ailments is presented as a preliminary to the presentation at a later date of the remote effects which are even more important. The percentage mortality is small, the morbidity is practically nil, and the after-results are excellent. In a large number of operations for the cure of sterility there were no deaths. By comparing these results with those obtained by the workers in radium and *x*-rays, knowledge can be gained as to which is the better.

List of Operations.

Digital dilatation of vagina	3
Hymenectomy	1
Piles	11
Vulvectomy	7
Urethral carunele	1
Perinæorrhaphy (complete)	9
Colpo-perinæorrhaphy (incomplete) ...	73
Hæmatoma of vagina opened	1
Cystoscopy	3
Bartholin's cyst	5
Vesico-vaginal fistula	3
Cervix, posterior division	19
Trachelorrhaphy	26
Partial amputation	19
Circular amputation	29
Dilatation and curettage alone	62
Do., accompanied by other operation ...	201
Anterior colporrhaphy	11
Pelvic abscess	6
Incomplete abortion removed	2
Vaginal suspension	2
Interposition of the uterus	7
Radium treatment of cervical cancer ...	3
Utero-sacral ligaments shortening ...	16

List of Operations—*continued.*

Gilliam's operation (modified)	98
Ventral suspension, chiefly with separation of adhesions	62
Ventral fixation	5
Alexander Adams operation	34
Ovariotomies and parovarian cysts ...	30
Plastic operations on tubes and ovaries ...	89
Tubal pregnancy removed	6
Abdominal myomectomy	26
Hysterectomy (subtotal)	27
(Total)	9
(Wertheim)	9
Appendicitis	37
Exploratory laparotomy in which nothing was done—	
Tubercular peritonitis	2
Cancer	4
Abdominal pregnancy	1
Mesenteric tumour	1
Breast abscess	2

Art. XI.—*Major Operations in Private Practice.* By D. Hennessy, M.D., Medical Officer, Bandon Dispensary, Co. Cork.

In reporting the following cases I have no desire to make anyone think that operations can be better performed in private homes than in public hospitals; but if one has a nurse trained to sterilise instruments, dressings, &c., the operation can be made very nearly as easy for the Surgeon as it would be in a hospital. At any rate, these cases I here report will go to show that major operations can be successfully performed outside of hospitals.

Cæsarean Section.

It is now more than six months since I performed this operation. I have nothing particular to say about the

technique, as I followed the usual method. Before incising the uterus I injected 1 c.c. pituitrin, and got an assistant to stand by the patient's abdomen, face towards the feet, and press with both hands against the lateral walls of the uterus—that is, having one hand on the right side and the other on the left, with the ulnar border of the palms against the side of the uterus—this helping a good deal to control haemorrhage. One should always have a large sterile towel to pack into the peritoneal cavity above the uterus in order to keep the intestines from slipping down. I had no difficulty in lifting the child out of the uterus. It almost floated up on the gush of amniotic fluid. There was no trouble with the placenta, and the bleeding was not alarming. I clamped the cord, cut it, and handed the baby to the nurse; child quite strong; presentation was a breach. I had six needles ready, with catgut sutures, No. 2, which I quickly inserted into the wall of the uterus, and once they were tied the bleeding ceased.

It is, of course, important that one should look carefully for clots in the pelvis and peritoneal cavity, and have them sponged up before the peritoneum is closed. I closed the abdomen in the usual way. At the operation I had the assistance of a neighbouring practitioner and two maternity nurses; also a trained nurse who was in the habit of assisting me.

I will now say something about the condition of the patient prior to the operation. The labour was full time, primipara, aged twenty years; the course of the pregnancy was normal in all respects. The patient had labour pains for five days prior to the operation. During that time I saw her once, and sometimes twice, daily, the nurse being all the time in attendance. The patient had two enemas, and slept at intervals between pains. On the night of the fourth day, about 10 o'clock, I injected 1 c.c. pituitrin (not without some misgivings). The nurse sent for me next morning about 8 o'clock a.m., and said the patient had had strong labour pains for the greater part of the night, but slept about 5 a.m., being then very exhausted. On ex-

amination, I found the os more dilated than on the previous night; now about the size of half-a-crown, membranes unruptured and birth not engaging. Up to this I could not make certain about presentation, whether vertex or breach. External palpation was unsatisfactory, owing to the patient being very fat. I now saw that there was no chance of delivering a live child per *viam naturalem*, so decided to perform Cæsarean section. I had anticipated this, as I could see that the pelvic measurements were below normal. After the operation the patient felt comfortable and suckled her baby, having no pain to speak of. A slight stitch abscess set in about the sixth day, but very soon cleared up.

I have heard it urged that Cæsarean section should be more frequently performed, and it looks as if a good deal could be said in favour of that opinion. Some short time after this I attended two cases; both were primiparæ, and were confined the same day. It happened that the position was occiput posterior in the two. I delivered both with forceps. One was a very difficult case, and it took a long time to effect delivery, although the patient was under chloroform. A few days after, sepsis set in, owing to some tears in vaginal mucous membrane, and for weeks this woman was in a very critical and miserable condition, and eventually had a course of autogenous vaccines to regain her health. The condition of the woman after Cæsarean section was heaven compared to this, and it is generally the case that patients are very helpless and miserable after difficult forceps delivery, especially occiput posterior cases. I might say that I have performed version in some of these cases with very good results. I believe that this is now much advocated by some in the United States.

Appendix Abscess.

This case was a man, aged about sixty years, a farmer. He was ill for about twelve weeks before I saw him. When I first saw him he was confined to bed, complaining of pains in ankles, knees and hips, having a temperature of 102° F. He had a very coated tongue, and looked ill, and

thought he suffered from rheumatism, being told so by the doctor who attended him. On examining him I found his ankle joints tender and swollen. In the right iliac region I discovered a swelling, tender and fluctuating, which I diagnosticated as appendix abscess, walled off in the iliac fossa. I told the patient he should have an operation, and he preferred having it done in his own house. With the assistance of a neighbouring practitioner and two nurses, I cut into the abscess; pus flowed profusely. I easily discovered the appendix, which was ruptured and very decayed. I put a ligature around the base, having taken away the distal part in fragments. I inserted two drainage tubes, one in the flank posteriorly, and one from the iliac fossa in front, and then closed the abdomen. For some days there was a profuse discharge, and the abscess cavity was gently douched out with eusol, the patient being well tilted to the right side. The tubes were removed in about fourteen days, the discharge having then nearly ceased. The patient was doing well, temperature normal, and was having enemas to keep the bowels moving. I kept the nurse in attendance all the time, and told her that I anticipated a fæcal fistula. At times the discharge smelt fæcal, but this gradually got less, and at the end of two months the whole thing had healed up, with the exception of a very small sinus, from which nothing came perhaps for a week. Things continued like this into the third month, and we were hoping that the patient had escaped a fistula, when one day the nurse found the dressing saturated with fæcal-smelling discharge, which then came away profusely for a week. At the end of that time we had no doubt that a fistula was present, and, as the patient consented to a second operation, I decided to try and close the fistula. Under an anæsthetic I passed a probe into the sinus, and left it there as a guide. I then opened the abdomen somewhat outside, and above, the sinus. I had great difficulty with adhesions, the cæcum being all adherent to parietal peritoneum. However, after a great deal of trouble, I located the aperture in the cæcum, a pretty

large opening, evidently the original seat of the appendix. I put an intestinal clamp around the aperture, freshened the edges, sutured them with catgut, buried that suture under a silk suture, put a drainage tube in front, and closed the abdomen. I kept on the wound a gauze dressing soaked in eusol, having it changed twice daily. For a week the patient got nothing by the mouth except sips of water; he was fed by the rectum, and had rectal salines. His temperature kept normal, and he did well. In a week the tube was removed, but we kept on with the gauze and eusol dressing. Very soon all discharge ceased, and in about six weeks the patient was up and about, feeling well and strong. His fistula completely closed, and has given him no trouble ever since. This later operation was in May, 1918.

OPEN AIR TREATMENT OF INFLUENZA-PNEUMONIA.

Open air treatment of influenza-pneumonia cases has been widely advocated and has been put into practice in Boston in a very efficient way. The State Board of Health sent out a letter saying that it was so firmly convinced of the efficiency of the sunshine and open air treatment of influenza-pneumonia cases that it was making use of the Press to get quick action in placing the information before city officials. The first effect noticed of this, the so-called Brooks' treatment, was that the nurses and doctors did not take the disease. Before this method was adopted the hospitals were all crippled; in one hospital 100 per cent. of the medical and nursing staff succumbed. The patients are put in tents or wooden shacks, and so placed that sunlight can fall directly on them at some time during each clear day. Air can blow freely over the patient. The expense of tents has made it necessary to use wooden shacks so built that air and sunshine can have free access to the patients, who are kept warm and comfortable, and when put in the fresh air their high fever falls.—*The Canadian Medical Association Journal*, January, 1919, page 76.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Om Abdominal-Reflexerne. Et Klinisk Bidrag til Reflexæren paa Grundlag av Undersøkelser av 472 Kasus. Av G. H. Monrad-Krohn. Kristiania : Steenske Bogtrykkeri. 1918.

On the Abdominal Reflexes. A Clinical Contribution to the Reflexes based on Observations in 472 cases. By G. H. Monrad-Krohn. Christiania. 1918.

This monograph on abdominal reflexes is based on the examination of 472 cases—the overwhelming majority of which presented neurological diseases of various kinds. The author discusses the occurrence and significance of the abdominal reflex in various conditions. Most of his observations concern the pathology of the reflex—only the most important of which can here be summarised.

As regards the normal abdominal reflex, he has not much to add to what previous writers have already observed. He confirms the statement that, given normal conditions of the abdominal wall, of the underlying abdominal organs and the nervous system, the reflex is practically a constant one, and symmetrical—*i.e.*, equal on both sides. It is, however, less constant in infants, and on account of this has but very little diagnostic value during the first six months and, in fact, a very limited one during the whole first year of life. Towards the eve of life the reflex again becomes less constant. Repeated pregnancies no doubt account for loss of the abdominal reflex in a number of cases, although, on the other hand, the reflex may remain brisk even after numerous pregnancies. (As an instance the author records a case of a woman, aged 41, pregnant in the sixth month, and *for the 11th time*, where the abdominal reflexes were brisk and equal.) During the puerperal period the abdominal reflex is frequently unequal

(apparently due to uneven stretching of the abdominal wall).

The author elicits the abdominal (and epigastric) reflex by means of a stroke with a pencil, or more commonly a pin, in the different regions of the abdomen, and accordingly distinguishes between epigastric and supra-umbilical, umbilical and infra-umbilical reflexes. The motor response consists in a *homolateral contraction of the abdominal muscles, resulting in a lateral deviation of the umbilicus and the linea alba.* In order to observe this the more easily, one has found it advantageous to draw a line with a skin pencil from the xiphoid process to the symphysis ossium pubis. When the stimulus is not too strong it is easily seen that the motor response corresponds to the stimulus in level—in other words, the *normal abdominal reflex is a homosegmental reflex.* When the abdominal wall is fat and flabby, the author recommends stroking vertically in the lateral part of the abdomen between the nipple line and the anterior axillary line. This is, in most cases, still in the central part of the reflexogeneous zone—and a stroke here is less apt to cause a disturbing "wave" in the fat abdominal wall which may conceal or simulate a possible deviation of the umbilicus.

As for the reflex, which by some authors (*e.g.*, Church and Petersen in their well-known text-book) is described as an abdominal reflex—elicited by a tap on the costal margin with homolateral deviation of the umbilicus as response, the author points out, that this is altogether a different sort of reflex from the abdominal reflex proper, which is a cutaneous reflex. It is often exaggerated where the real abdominal reflex is abolished, as in a pyramidal lesion (*cf.* the chapter on disseminated sclerosis). The author therefore proposes to term this reflex *the periosteal reflex of the costal margin.* It belongs to the order of "deep" reflexes, and has nothing to do with the cutaneous abdominal reflex, as described above.

Normally, exhaustion of the abdominal reflex is, as a rule, not noticeable, whereas, on the other hand, "facili-

tation" is quite commonly seen. On the hand of observations of a case, where facilitation was particularly strong, the author tries to show that the sensation of tickling, which, as a rule, accompanies the abdominal reflex, is a result of the reflex—a sensation of the motor response (just as tickling elsewhere may be regarded as the sensation caused by reflex contraction of the musculi arrectores pilorum), not the exciting stimulus itself, as Munch-Petersen will have it.[a]

As regards the abdominal reflex in pathological conditions, the author confirms the fact that a pyramidal lesion (cortical, capsular, mesencephalic or spinal) tends to abolish the reflex, just as, of course, a lesion of the more peripheral part of the reflex arc does.

In partial paralysis of the abdominal wall unaccompanied by any sensory loss, the author has found that from the paralysed areas of the abdominal wall it requires a stronger stimulus to elicit the abdominal reflex, and that this reflex, when elicited, in contradistinction to the normal abdominal reflex, gives a maximal motor response at a level different from that of the eliciting stimulus—*i.e.*, outside the paralytic area. In other words, whilst the normal abdominal reflex is homosegmental (maximal motor response corresponding to the level of the eliciting stimulus (*cf.* above), the abdominal reflex elicited from a paralytic (but not anæsthetic!) part of the abdominal wall is heterosegmental. This *heterosegmental abdominal reflex* is characteristic of a partial paralysis of the abdominal wall (unaccompanied by gross sensory loss), as frequently seen in poliomyelitis.

Whilst peripheral motor disturbances thus cause a distinct alteration of the abdominal reflex, reflex changes do

[a] In the case referred to a certain stimulus (stroke with a piece of paper) elicited a motor response only when preceded at an interval of less than 4 seconds by one or more stronger stimuli eliciting marked motor response ("facilitation"). When thus eliciting an abdominal reflex this stimulus caused a tickling sensation, whilst when applied without preceding facilitation and eliciting no reflex it failed to cause any tickling sensation.

not obtain so markedly in peripheral sensory disturbances. Thus, in tabes—even where there is a slight hypoæsthesia over the abdomen—one generally finds the abdominal reflex brisker than usual. Only when in tabes there is a pronounced hypoæsthesia—a relative anæsthesia—over the abdomen, one finds the abdominal reflex diminished or abolished in the hypo(an-)æsthetic area.

In hysteria with one-sided sensory disturbances over the abdomen, one finds as a rule the abdominal reflexes unequal —exaggerated in the case of one-sided hyperæsthesia— diminished respectively abolished in the case of one-sided hypo-or anæsthesia.

In paralysis agitans and chorea the abdominal reflexes are as a rule found exaggerated on the side affected (or chiefly affected).

Finally, the author, on the strength of his observations, submits that the reflex has a long cerebral arc, which reaches up to psychosensory and psychomotor areas of the brain, and that besides this long cerebral arc (as accepted by most authors, denied by a few, amongst others Déjerine) there is an impeding or controlling apparatus represented by the rubral system, lesion of which (paralysis agitans = lesion of lenticulo-rubral or fronto-rubral tracts? chorea = lesion of cerebello-rubral tracts?) causes an increase of the abdominal reflex.[a]

The author's view on the anatomical mechanism of the abdominal reflex is seen from a diagram.

It is, however, strongly accentuated that this must only

[a] As regards the disturbance of tonus in paralysis agitans and chorea one has to believe that the tonetic influence through efferent cerebellar (cerebello-rubral and cerebello-spinal) tracts is normally counteracted by dystonetic influences through pyramidal and lenticulo-rubral (fronto-rubral) tracts. When one of these latter is affected, the result is hypertonicity (pyramidal lesion, paralysis agitans), when the efferent cerebellar tracts are affected, hypotonicity. Thus lesion of the lenticulo-(?fronto-)rubral tract gives hypertonicity and increased abdominal reflexes (paralysis agitans) — lesion of cerebello-rubral tract gives hypontonicity and increased abdominal reflexes (chorea).

be regarded as a working hypothesis. The actual anatomical facts are not by a long way established yet, and it is obvious that in reality the reflex mechanism is vastly more complex than the diagram indicates.

A Manual of Physiology, with Practical Exercises. By G. N. Stewart, M.A., D.Sc., M.D. Edin.; D.P.H. Camb.; Professor of Experimental Medicine, Western Reserve University. London: Baillière, Tindall & Cox. 1918. Demy 8vo. Pp. xxiv + 1245.

The eighth edition of this well-known Manual exemplifies the clearness of statement and exposition characteristic of the physiological text-books published in America.

It has been revised in many important directions—in particular, the chapters dealing with the chemical changes of respiration, the functions of the endocrine organs, and metabolism. Some of the newer results of calorimetric work, of optical methods for recording circulatory changes, and a statement of the filtration-reabsorption theory of urine formation, formulated by Professor Cushney, are introduced.

A newly added appendix of bibliography will prove useful for senior students who may desire to undertake original work. The papers and monographs cited are mostly in English, and will provide references for further exploration in the literature. The practical exercises have constituted a feature of the preceding editions. They emphasise afresh the wide field open to students in America in contrast to the laboratory courses usual in this country—hampered by lack of time and of equipment and by legal restrictions.

The Manual is rather large for the ordinary medical student. The time allowed for physiological study in many Medical Schools has been reduced to nine months, so that even if the student begins his studies with a sound foundation of physics, chemistry, and biology—alas, too often lacking—he will find it difficult to acquire a know-

ledge which might enable him to think physiologically when at the bedside. On the other hand, teaching experience has convinced us that a condensed exposition of the subject gives at most a fugitive equipment for examinations.

The following points might be corrected or remodelled in the next edition :—

The paragraph on page 260, on the Haldane-Smith method for oxygen tensions, is not quite explicit enough, and the discussion of the tensions of blood gases (pp. 261-2) is rather too extended. The use of colloid-saline injections for hæmorrhage, introduced by Bayliss, is not mentioned.

The reproductions of Campbell's figures of cortical cells lamination are not clear, and might with advantage be replaced.

Marie's views on aphasia might be illustrated with advantage.

Some mistakes in the index have escaped notice. The Manual is probably the best of its size for the advanced student and for the physician who desires to keep in touch with present-day physiology.

An Inquiry into the Medical Curriculum. By the Edinburgh Pathological Club. Edinburgh : W. Green & Son. 1919. Large 8vo. Pp. iv + 512.

This large volume contains a number of papers contributed to an important inquiry into the Medical Curriculum instituted by the Edinburgh Pathological Club, together with a valuable report by the Club.

The inquiry was carried out during the Session of 1917-1918. Papers were contributed by members of the Edinburgh Medical School, but contributions were also obtained from eminent teachers in the other Scottish Universities, and also from members of the Medical Schools in Oxford, London, Dublin, Manchester, Newcastle, and Birmingham. A series of papers was also included dealing with special subjects by members of the Royal Army Medical

Corps, by general practitioners of Medicine in England and Scotland, and by members of the scholastic profession.

At the conclusion of the inquiry the Club appointed a Special Committee to review the whole discussion, and formulate the conclusions to which it had led. The Committee's report was adopted by the Club at its meeting on November 27, 1918.

The papers, with a *résumé* of the discussion and the final Report adopted by the Club, were originally published in the *Edinburgh Medical Journal*—a matter which was of invaluable assistance to the inquiry.

The expenses of issuing the Report in reprint form in the fine volume before us have been defrayed by a grant from the Carnegie Trust for the Universities of Scotland, for which the Club begs to express hearty thanks.

Professor J. Lorrain Smith was the Convener of the Special Committee, and Dr. Harry M. Traquair was its most efficient Secretary.

The volume is of great importance, and should be in the hands of all who are keenly interested in the Medical Curriculum—its shortcomings and its amendments.

Trench Fever. Report of Commission, Medical Research Committee, American Red Cross. Prepared for Publication by RICHARD P. STRONG. London: Henry Frowde and Hodder & Stoughton, Oxford University Press. 1918. Pp. viii + 446.

THE work of the Commission of the Medical Research Committee, American Red Cross, on Trench Fever is already fairly well known to those specially interested in that fever, but the publication of the present volume will enable the profession at large to familiarise itself with the subject, and will also enable it to estimate correctly the invaluable character of the work that has been performed. The record is, indeed, one of which the American Medical Service may well be proud. As an example of how a problem should be dealt with, and how, by means of "team work," rapid and important conclusions with

reference to a complicated question may be answered, even under war conditions, the present Report is probably unique in the history of Medicine.

Major Strong, who is responsible for preparing this volume for publication, and who was throughout the moving spirit in organising and directing the work of the Commission, realised late in 1917 that the subject of the method of transmission of trench fever was one of the most important for investigation in connection with the loss of man-power in the Allied Armies. A Commission was appointed to carry out this investigation early in 1918, and within a couple of months the problem was solved, and the louse incriminated. The study involved the clinical observation of trench fever cases; an elaborate and detailed serological and bacteriological investigation, with the object of distinguishing the disease from enteric and other fevers, and proving its existence as a clinical entity: a series of experiments with reference to the transmission of the disease by injection of blood of infected persons into healthy men; and many experiments in connection with the suspected agency of lice in transmitting the disease. Numerous side questions also cropped up, and were successively dealt with. For the conclusions arrived at and for an account of the methods adopted, we must refer our readers to the book itself. It is destined to become a classic, and to show the way for similar investigations in the future.

It is but right and fitting, and only due to them, to name the Members of the Commission. They were the following:—Richard P. Strong, Major, M.R.C., Assistant Director, Division Laboratories and Infectious Diseases: Homer F. Swift, Major, M.R.C., Senior Medical Officer, No. 1 United States Army, General Hospital, B.E.F.: Eugene L. Opie, Major, M.R.C., Pathologist, United States Army General Hospital, Base 21, B.E.F.; Ward J. Macneal, Captain M.R.C., Head Department Bacteriology, Central Med. Dept. Lab., A.E.F.; Walter Baetjer, Captain, M.R.C., i/c Clinical Lab., United

States Army, Base Hospital No. 18, A.E.F.; A. M. Pappenheimer, Captain, M.R.C., Pathologist, No. 1, United States Army General Hospital, B.E.F.; A. D. Peacock, Captain, R.A.M.C. (T.), 2nd London Sanitary Coy. (Entomologist), (subsequently attached); David Rapport, 1st Lt., M.C., National Guard, A.E.F.

A Manual of Elementary Zoology. By L. A. BORRADAILE, M.A. Second Edition. London: Henry Frowde and Hodder & Stoughton. 1918. Pp. xii + 616.

EASILY read and well worth reading. The author deals, first, with his subjects from the anatomical point of view, then seeks from physiology light upon the meaning of the processes described. He next traces the provision for carrying out the various functions. The body as a whole is the object of his survey, and he is careful to treat the metazoa not as colonies of individual cells, but as beings who have set apart certain groups of these cells for special functions.

The introductory chapter impresses upon the student that vital phenomena depend upon the body constantly undergoing disintegration with evolution of energy.

There are new chapters upon Parasites and Cold-blooded Vertebrates, and clear instructions for obtaining, observing, and dissecting specimens.

Some excellent illustrations by Thornton Shiells have also been added to this edition, and there is a sufficient index.

The Early Treatment of War Wounds. By COLONEL H. M. W. GRAY, C.B., C.M.G., M.B. Aberdeen: F.R.C.S. Edin.; Consultant in Special Military Surgery, late Consultant Surgeon, British Expeditionary Force, France. London: Henry Frowde and Hodder & Stoughton. 1919. Pp. xv + 299.

THIS is one of the most interesting and eminently practical War Manuals we have read.

The author is a master of his subject, and he knows it. What a pity this Manual did not appear (as it now does) two and a half years ago, and what a difference it would have made to many a poor wounded soldier! Though the war is almost as good as ended, the book will lose none of its interest to the surgeon who has got to treat an injured man. Such will be treated on similar lines at home, and blood transfusion will no longer be a source of wonder. We strongly recommend the study of the Manual to everyone interested in the treatment of wounds.

Our Baby: For Mothers and Nurses. By Mrs. J. Langton Hewer, Certified Midwife; late Hospital Ward Sister. Sixteenth edition, illustrated and revised (140th thousand). Bristol: John Wright & Sons, Ltd. 1918. Cr. 8vo. Pp. viii. + 163.

Little need be said in way of praise or of blame about a book which has passed through fifteen editions in twenty-five years, and of which the present—the sixteenth—edition completes an issue of one hundred and forty thousand copies.

The work has been revised once more. The authoress tells us that, since the establishment of centres to which mothers are encouraged to bring healthy and normal babies for examination and advice, scientific observers have been able to formulate with much greater exactness the best methods of rearing them. It has, therefore, been found advisable to almost rewrite and, at the same time, to simplify and re-arrange the chapter (IV.) which deals with artificial feeding.

We wish the authoress would discard such misleading terms as German measles (page 114) and "croup" (page 117). Their use detracts from the scientific accuracy of the book.

The great charm about this book is its very human character, and the motherly sympathy which so often wells up in its pages. Not for the first time we can recommend it to all young mothers and to nurses in general.

Kala-Azar: Its Diagnosis and Treatment. By Ernest Muir, M.D., F.R.C.S. (Edin.); Mission Hospital, Kalna. Calcutta and London: Butterworth & Co. 1918.

This is a very brief and very useful little book. It is favoured by a foreword by Sir Leonard Rogers, who states that he is assured that Dr. Muir's treatment is sound, and may be safely followed with great advantage to sufferers from kala-azar. It is further claimed that patients treated as herein described cease to be infectious to others.

The book describes, first, the clinical features of kala-azar, or "black fever," and indicates the most important points to be looked for in making a differential diagnosis. The technique of splenic puncture is also clearly described.

The treatment advocated is the intravenous injection of antimony salts. When thoroughly carried out this treatment appears to cure most cases within three to four months. Full details are given, and accessary therapeutic measures are also described.

Every medical man who works in a kala-azar district should at once obtain this book, and familiarise himself with its contents.

The Dublin University Calendar for the Year 1918-1919. Volume II. Dublin: Hodges, Figgis & Co., Ltd. 1919. 8vo. Pp. iv + 210 + 203.

The contents of this volume are twofold. In the first part will be found lists of the honours awarded in 1918; also the pass lists at the various examinations held during that year, and the Degrees conferred. There is the usual continuation of the lists published in a special supplemental volume for 1912-1913.

We are glad to find from a numerical statement at page 142 that the ancient foundation of Trinity College, Dublin, is already showing signs of recovery from the war-time low-water mark of the previous year, when the total number of students on the College Books under the standing of M.A. had fallen to 721. This year the number has risen to 777—

a material advance seeing that the Armistice was not signed until November 11, 1918. The number is made up as follows :—

Women—		
Non-Foundation Scholars	15	
Pensioners	187	
Sizars, Ex-Sizars, and Sizarship Exhibitioners	8	
	——	210
Men—		
Scholars of the House	19	
Pensioners	482	
Sizars, Ex-Sizars, and Sizarship Exhibitioners	36	
	——	567
		777

Twice in each year the number reaches a maximum—namely, just before the first Saturday in June, and just before the first Saturday in December. This maximum for December, 1918, was 875 = 777 + 107—2—7.

The second part of Volume II. contains a list of the Electors of the University of Dublin, with their qualifications. The number on the roll is 1,611, compared with 1,148 in the previous year. Floreat Alma Mater ad multos annos!

The Treatment of Infected Wounds. By A. Carrel and G. Dehelly. Translated by Herbert Child, Captain, R.A.M.C.; formerly Surgeon, French Red Cross. With Introduction by Sir Anthony Bowlby, K.C.M.G., K.C.V.O., F.R.C.S.; Major-General, A.M.S.; Advising Consulting Surgeon to the British Armies in France. Second Edition. London: Baillière, Tindall & Cox. 1918. Pp. x + 265.

It is only necessary for us to mention that a second edition of this interesting book has been issued. It is thoroughly revised, and brought fully up to date. We feel sure the book will lose none of its interest, even though the war is at an end.

PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

President—Sir John Moore, M.D. Dubl., F.R.C.P.I.
General Secretary—J. A. Scott, M.D., F.R.C.S.I.

SECTION OF OBSTETRICS.

President—Alfred Smith, M.D.
Sectional Secretary—Bethel Solomons, M.D., F.R.C.P.I.

Friday, January 10, 1919.

Dr. Henry Jellett in the Chair.

Endothelioma of the Ovary.

Dr. Ashe read a paper illustrating this condition. He had shown the specimen previously at the Academy. Three months after the ovary had been removed by him and Dr. Purefoy the patient became pregnant and was delivered of a full term baby without event.

Dr. Ashe gave a history of the case. He dwelt on the fact that the other ovary was small and atrophic, and he was surprised when the patient became pregnant. He discussed endothelioma generally. [His paper is published at page 119.]

Dr. Purefoy said:—I have only to add that the affected ovary was so little enlarged and so little troublesome that it might very easily have been overlooked. The healthy ovary was so small and shrunken that its functional activity seemed somewhat problematical. The return of menstruation and conception shortly after the removal of the diseased ovary suggest that some inhibitory action was exercised by the diseased organ.

Dr. Jellett said that he did not approve of leaving the

second ovary if the first was known to have undergone malignant change of any kind, as the danger of a simultaneous malignant condition in both ovaries was too great.

Sir W. Smyly and Dr. Solomons spoke.

Double Uterus.

Dr. Jellett showed a pyosalpinx and ovarian abscess removed from a patient aged twenty-three, who had a double uterus. The left side alone was affected, the right horn of the uterus and corresponding ovary and tube being quite healthy. The uterine cornu on the infected side was also removed. The pus from the abscess contained streptococci and colon bacilli. The patient was making a good recovery.

Dr. Rowlette said it was remarkable how often an infected process was present in cases of double uterus.

A Note on 500 Consecutive Operations performed at Mercer's Hospital.

Dr. Bethel Solomons made this communication. [It is published in full at page 154.]

Sir William Smyly said he believed in the modified Gilliam operation for backward displacement. Despite the unfortunate results which had been reported following ventral suspension he still did the operation with satisfactory result. He did not approve of Alexander Adam's operation, as he liked to see the inside of the abdomen. He agreed with the main principles of Dr. Solomon's paper.

Dr. Ella Webb asked if the cases of pneumonia were recent, and if pure ether was the anæsthetic employed. She agreed that great care must be taken to keep the patients warm in going to and coming from the theatre.

Dr. Rowlette said that a *definite* diagnosis as to malignancy in large ovarian tumours was sometimes impossible. He thought that most papillomatous tumours were malignant. He suggested that chloroform might be re-introduced as an anæsthetic when the doctors came back from France, and he did not welcome the idea.

Dr. Ashe said that he agreed with the author of the paper that it was important to exclude the male as the cause of sterility before operating on the female.

Dr. Jellett considered Alexander's operation was the ideal one for all cases of undoubtedly uncomplicated back-

ward displacement, but that it was contraindicated in cases associated with sterility or any possible pelvic complication.

Dr. Solomons, in reply, said that he had had no recent cases of pneumonia. Ether or gas and ether was the anæsthetic employed in his cases, and he would never permit the use of chloroform. He thought that many women would be saved unnecessary operations for sterility if the male semen were examined.

Friday, February 14, 1919.

Tendons of the Uterus and their Relations to the Lower Uterine Segment.

Professor Hastings Tweedy read a paper on the above subject. He said that gynæcologists are, or should now be, agreed that the uterus owes its stability to fibro-muscular bands which radiate in every direction from the muscles which surround the os internum.

These fibro-muscular bands are under the full control of the uterus; when the os opens they relax, when it closes they again become taut. They act as true tendons to the muscle, and should be called "uterine tendons," rather than ligaments.

These tendons constitute the true boundary between the cervix and the body of the uterus. They take up all strain from the cervix so long as they remain intact, with a closed os internum. In pregnancy the os opens and the ovum comes to lie in the upper region of the cervix and beneath the uterine tendons.

The cervix invariably hypertrophies at the part exposed to any continuous pressure. This pressure is exercised on it by the growing ovum, and thus the lower uterine segment forms.

The Special Supports of the Uterus.

Professor A. F. Dixon read a paper on the above. [See page 119.]

Sir William Smyly said that he had known that the subperitoneal tissue contained unstriped muscular fibres, and especially in the utero-sacral folds, which had been described as retractor muscles of the uterus, but he had no idea that the tissue around the cervix, and especially that of the

cardinal or Mackenrodt's ligaments contained so much of that tissue as had been stated by Professor Dixon. His description of those fibres as originating from the substance of the uterus and radiating to their pelvic insertions sufficiently explained the fact that this tissue is not ruptured in childbirth, as it certainly would be if arranged as a diaphragm across the pelvis. If he had correctly understood Professor Dixon, the opening of the os might be compared to that of the pupil, the cervix representing the circular fibres of the iris. If that were so the mechanisms would be the opposite to what had been supposed, for, as the cervix dilated, the connective and muscular tissues instead of being stretched would be relaxed, their origins in the uterus being approximated to their pelvic insertions. That the cardinal ligaments were mainly responsible for holding the uterus in place could scarcely be doubted by anyone who had performed a hysterectomy. In a patient in whom serious dystocia resulted from a myoma he had found the tumour firmly attached to one of these ligaments. On two previous occasions Cæsarean section had been performed by other operators, and he delivered her in a similar manner; but he also removed the tumour, which was about the size of a Tangerine orange. Myomata, either in the body of the uterus or in the cervix, were usually drawn upwards or pressed downwards during labour, but when attached to the cardinal ligament they could neither be drawn upwards or pressed downwards, but remained fixed, thus causing dystocia. In the case alluded to he had to divide the left uterine artery and cut away the tumour with scissors from a firm band placed vertically, and which resembled in appearance fibrous tissue. He thought that Dr. Tweedy's idea that these ligaments acted like tendons to the uterus was a reasonable one; and it had always appeared to him that unless some restraining force existed the uterus would tear itself away from the vagina. Professor Dixon's statement that some of the muscle fibres were attached to the vagina was very probably an explanation of the well-known fact that in cases of threatened abortion a ballooning out of the fornices accompanied uterine action.

Dr. Purefoy said he did not think that these uterine ligaments, or more correctly muscles, took an active part in effecting dilatation of the cervix, though he believed they

steadied it while that process was going on. Professor Tweedy's views as to the growth of the cervix during pregnancy commend themselves as having good foundation.

Dr. Spencer Sheill said he thought that Dr. Tweedy's views proved the great benefits which were obtained by minor gynæcological operations.

Colonel Chambers said:—I would like to point out the method of the uterine attachments of the lateral cervical ligaments, or Mackenrodt's ligaments, as they are called. These ligaments or tendons, as they have been termed, undoubtedly contain a large amount of unstriped muscle fibre, which is more abundant, perhaps, and preponderates over the fibrous tissue in the young subject than in the adult. In the young subject these muscular fibres can be seen to be grouped into definite bands following definite courses. I have lately been studying microscopic sections of pelvic viscera of the female infant. In all of these the following plan seems to be adopted.

In the region of the lower part of the cervix and the upper part of the lateral vaginal fornices there is a definite mass of tissue which is apparently continuous with these structures on either side. These masses are, of course, Mackenrodt's ligaments. As these approach the cervix uteri laterally they split, and two definite bands of muscular fibres can be demonstrated, running, one anteriorly, the other posteriorly, to the cervix. These bands are continuous with similar bands coming from the opposite side. They actually form part of the musculature of the cervix uteri, and are interlaced to a certain extent with fibres running in other directions. My conception of the way the uterus is suspended by these ligaments is as follows:—It is held between these two flat bands of muscular tissue anteriorly and posteriorly in the region of the cervix, which are slightly on the stretch and gain attachment laterally to the pelvis. This would allow free mobility of the uterus in every direction, and by their muscular tone would tend to return the uterus to its normal position after it had been displaced. The method in which the bands are placed would not prevent the cervix and os dilating in pregnancy and labour; nor would they be torn by such dilatation. The anterior band would be displaced anteriorly and the posterior one posteriorly, and the only fibres that would still remain to dilate would be the circular one.

Of course, these are not the only supports of the uterus in the pelvis, but there are others, such as the pelvic floor, which all aid in the suspension of the uterus.

Dr. Henry Jellett, speaking to Professor Dixon's paper, said that very considerable information as to the nature of the supports of the uterus could be obtained from a series of horizontal sections of the pelvic contents made in the full-time fœtus and in the adult. In the fœtus such sections showed that the urethra and base of the bladder, the vagina and lower part of the uterus, and the rectum, were united by a capsule, fibrous in appearance, to the pubic bones in front, to one another, and to the sacrum and coccyx posteriorly. As these organs increased in size, this capsule, so far as its uterine and vaginal portion was concerned, was drawn out into vertical bands, forming in the case of the uterus the utero-sacral ligaments, and in the case of the vagina the vaginal suspensory ligaments. It was impossible to study such a series of sections without finding that in this way the major supports of the uterus were formed, and which were thus constituted by the utero-sacral ligaments and the vaginal attachment, the latter being in turn held by the vaginal suspensory ligaments. Clinical proof of these supports was readily to be found when performing either Wertheim's hysterectomy or total vaginal extirpation.

Both the uterine and vaginal ligaments were undoubtedly incorporated in, and formed part of, the walls of the vagina and uterus at their point of attachment, and in view of Professor Dixon's investigation we must regard them as containing large quantities of involuntary muscle tissue.

Dr. Bethel Solomons said that the traumata which were found in association with prolapse of the uterus and the extensive repairs necessary to deal with the conditions, proved definitely that the two schools of thought—viz., the one which held that the "cardinal" ligaments were the chief supports of the uterus, the other which held that the pelvic floor was the chief support—were both at fault. Dr. Tweedy, with his views, and Dr. Paramore, with his views so excellently described in his recent work, might unite forces. To the clinical gynæcologist it was very evident that the ligaments and the pelvic floor combined as the chief supporters

of the uterus. Regarding the stress which was laid on cutting through Mackenrodt's ligaments during hysterectomy, he found that the other fibro-muscular supports were equally tough.

He related a case which he had encountered where both tubes had been completely extirpated. On opening the abdomen five years later he found that the uterus was lying upside down. There was no other trauma present, and he thought it strange that the removal of the upper portions of the broad ligaments, which were supposed to have such slight supporting value, should have caused such displacement.

Drs. FitzGibbon, Webb, and Neill also spoke.

Professor Tweedy, in reply, thanked the Section for the favourable way they had received his views, and he was particularly gratified to find that so great an anatomist as Professor Dixon was largely in agreement with him. Professor Dixon objected to the term tendon being applied to the continuation of an unstriped muscle, but such an objection should not hold in the presence of tissue which can be shown to functionate in a manner similar to that of tendons, even though arising from unstriped muscle.

Dr. Jellett drew diagrams which represented pelvic cross sections made by him, and in which he (Dr. Tweedy) could see no trace of the tissue known as Mackenrodt's ligaments. His sections were obviously made at a higher level than these ligaments, but they are of incidental value as demonstrating that the general parametrium takes no part in supporting the uterus, but rather that this support is afforded by the shallow ribbon-like structures of immense strength which radiate from the os internum.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

At at a special meeting of the President and Fellows of the Royal College of Physicians of Ireland, held on Friday, 14th March, 1919, Major Harold Pringle, R.A.M.C., M.D., F.R.C.S.I., Chief Assistant to the Professor of Physiology, and Lecturer in Histology, University of Edinburgh, was elected to the Chair of Institutes of Medicine in the School of Physic in Ireland, rendered vacant by the death of Sir William H. Thompson, G.B.E.

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, February 22, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, February 22, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 35.8 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, February 22, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 35.8 and 27.0; Dublin Registration Area, 45.2 and 31.8; Dublin City, 50.2 and 34.8; Belfast, 28.3 and 22.3; Cork, 39.4 and 29.6; Londonderry, 29.3 and 23.6; Limerick, 42.0 and 25.4; and Waterford, 30.4 and 26.6.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, February 22, 1919, were equal to an annual rate of 0.7 per 1,000. Among the 218 deaths from all causes in Belfast was 1 from diarrhœa and enteritis in a child under 2 years. Included in the 58 deaths from all causes in Cork are 1 from measles and 1 from diarrhœa and enteritis of a child under 2 years; and of the 23 deaths from all causes in Londonderry are 5 from whooping-cough. The 6 deaths recorded in Wexford included 1 caused by diphtheria and 1 from diarrhœa.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended February 22, 1919, amounted to 170—84 boys and 86 girls, and the deaths to 376—177 males and 199 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 25)

of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 45.2 per 1,000 of the population. The rate for all deaths registered during the eight weeks of 1919 ended February 22 was 29.3, while in the corresponding period of the preceding ten years, 1909-1918, it had been 25.5.

The 351 deaths appertaining to the Area included 5 from diarrhœa and enteritis of children under 2 years. Eighty-eight deaths from influenza were registered. In the three preceding weeks deaths from influenza in the Registration Area had numbered 3, 5, and 21 respectively.

Deaths attributed to pneumonia were 50 (comprising 25 from broncho-pneumonia, 4 from lobar pneumonia, and 21 from pneumonia, type not distinguished), as against 18, 24, and 43 in the three weeks preceding.

Tuberculosis caused 29 deaths as against 25, 30, and 31, respectively in the three weeks preceding. Of the 29 deaths ascribed to tuberculosis, 26 were referred to pulmonary tuberculosis, 1 to tubercular meningitis, and 2 to other forms of tuberculosis.

Ten deaths were caused by cancer, 19 by organic diseases of the heart, and 63 by bronchitis.

Among the deaths of infants under one year old, 2 were ascribed to convulsions, 3 to bronchitis, 7 to broncho-pneumonia, 4 to diarrhœa and enteritis, 3 to premature birth, and 6 to congenital debility.

Forty-eight of the deaths registered during the week appertaining to the Area were of children under 5 years of age, 29 being of infants under one year, of whom 10 were under one month old. One hundred and two deaths of persons aged 65 and upwards were registered, including 71 deaths of persons of 70 years or upwards.

Of the 351 recorded deaths 136 occurred in hospitals and other public institutions.

One death was caused by accident on a railway.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended February 22, 1919, and the cases under treatment at its close respectively, were as follows:—Enteric fever, 0 and 11; measles, 6 and 19; scarlet fever, 8 and 38 (exclusive of 20 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 3 and 6.

Seventy-three cases of pneumonia were admitted during the week, and 97 remained under treatment at its close, as compared with 39, 47, and 66 at the close of the 3 preceding weeks respectively. Of the deaths in hospital recorded during the week, 29 were from pneumonia.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, February 22, 1919, in 96 large English towns (including London, in which the rate was 34.2) was equal to an average annual death-rate of 35.8 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 38.4 per 1,000, the rate for Glasgow being 42.3, and that for Edinburgh 52.1.

METEOROLOGY.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of February, 1919.

Mean Height of Barometer,	29.749 inches.
Maximal Height of Barometer (9th, at 9 a.m.)	30.591 ,,
Minimal Height of Barometer (20th, at 9 a.m.)	28.918 ,,
Mean Dry Bulb Temperature,	38.4°.
Mean Wet Bulb Temperature,	36.9°.
Mean Dew-point Temperature,	35.1°.
Mean Elastic Force (Tension) of Aqueous Vapour	0.204 inch.
Mean Humidity,	86.8 per cent.
Highest Temperature in Shade (on 21st),	46.9°.
Lowest Temperature in Shade (on 28th),	28.1°.
Lowest Temperature on Grass (Radiation) (28th)	23.9°.
Mean Amount of Cloud,	59.7 per cent.
Rainfall (on 16 days),	1.401 inches.
Greatest Daily Rainfall (on 5th),	0.262 inch.
General Directions of Wind,	S.E., E.S.E., E.

Remarks.

February, 1919, proved to be a cold, damp, often dull month, of moderate but frequent rainfall. The mean temperature was rather lower than that of January, and no less than 7.4° below that of February, 1918—one of the mildest Februarys on record. Unlike last February also, the past month showed a complete absence (in Dublin) of surface S.W. winds—on the contrary, the wind blew almost constantly from points between S.E. and E. The upper clouds, however, were seen to travel from S.W. and W. on several days.

There were no gales in Dublin, but the wind blew freshly on the 8th, 9th, and 16th. The sky was much clouded, except from the 8th to the 12th, and again from the 23rd to the end —leaving out the 26th, which was overcast and dull, like so many days in the earlier part of the month.

In the clear evening skies towards the close the planet Venus shone brightly in the west, and the planet Jupiter also was seen to advantage near the meridian and at a great altitude.

A notable feature of the month was an intense frost which prevailed over a snow-covered country in France and Great Britain (more particularly in the south and south-east of England) during the first half of the month. On the 9th the thermometer in the screen fell to 9° at Raunds, Northants, and on the 10th to 5° at West Linton, Peebles. A complete change followed in the course of the week ended Saturday, the 22nd, with the arrival of a series of depressions from the Atlantic; much rain fell in England, and the temperature rose above 50° over the southern half of that country.

In Dublin the mean temperature (39.6°) was 2.8° below the average (42.4°). The mean dry-bulb readings at 9 a.m. and 9 p.m. were 38.4°. In the fifty years ending with 1915 February was coldest in 1895 (M. T. = 34.2°), and warmest in 1903 and in 1918 (M. T. = 47.5°). In 1914 the mean temperature was 46.0°, in 1915 it was 40.1°, in 1916, 40.8°, in 1917, 38.6°.

The mean height of the barometer was 29.749 inches, or 0.106 inch below the average value for February—namely, 29.855 inches. The mercury rose to 30.591 inches at 9 a.m. of the 9th, and fell to 28.918 inches at 9 a.m. of the 20th. The observed range of atmospheric pressure was, therefore, 1.673 inches.

The mean temperature deduced from daily readings of the dry bulb thermometer at 9 a.m. and 9 p.m. was 38.4°, or 0.8° below the value for January, 1919. Using the formula *Mean Temp.* = *Min.* + (*Max.* − *Min.*) × .50, the M. T. is 39.6°, compared with a thirty-five years' (1871-1905) average of 42.4°. On the 21st the thermometer in the screen rose to 46.9°—wind, variable; on the 28th it fell to 28.1°—wind, W.N.W. The minimum on the grass was 23.9° on the 28th.

The rainfall was 1.401 inches, distributed over 15 days. The average rainfall for February in the thirty-five years, 1871-1905, inclusive, was 2.010 inches, and the average

number of rain-days was 15. The rainfall, therefore, was considerably below, whereas the rain-days were equal to, the average. In 1883 the rainfall in February was large—3.752 inches on 17 days; in 1879 also 3.706 inches fell on 23 days. On the other hand, in 1891, only 0.042 inch was measured on but 2 days. In 1913, only 0.602 inch fell on 12 days; but in 1915, the rainfall amounted to 3.279 inches on 20 days, and in 1916, it was 3.559 inches on 26 days. In 1917, it was 1.702 inches on 11 days, and in 1918, 1.900 inches fell on 21 days.

Fog occurred on the 20th. The amount of cloud—59.7 per cent.—was below the average, which is 66 per cent. Snow or sleet fell on the 4th and 19th. Hail fell only on the 26th. There was a lunar halo on the 7th, and a lunar corona on the 9th.

Lightning was seen on the nights of the 1st and 19th. An aurora occurred on the night of the 27th-28th.

The temperature never reached 50° in the screen, but fell to 32° in the screen on five nights. The minima on the grass were 32° or less on 15 nights, compared with every night in 1895 and 16 nights in 1917. The thermometer failed to rise above 38.3° in the screen in the daytime on the 8th. The highest minimum was 42.7° on the 21st. The mean maximum was 43.4°, the mean minimum was 35.8°.

In Dublin the rainfall of 1919 up to and including February 28th amounted to 4.043 inches on 40 days, compared with 3.481 inches on 31 days in 1914, 5.374 inches on 38 days in 1915, 4.957 inches on 42 days in 1916, 2.989 inches on 30 days in 1917, 3.500 inches on 36 days in 1918, and a thirty-five years' (1871-1905) average of 4.220 inches on 33 days.

At the Normal Climatological Station in Trinity College, Dublin, Mr. A. W. Boyce reports that the mean value of the readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 39.9°. The arithmetical mean of the daily maximal and minimal temperatures was 39.9°. The screened thermometers rose to 48° on the 19th and 21st, and fell to 28° on the 28th. On the 26th the grass minimum was 16°. Rain fell on 16 days to the amount of 1.16 inches, the greatest fall in 24 hours being 0.26 inch on the 21st. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 61.9 hours, of which 7.6 hours occurred on the 25th. The mean daily sunshine was 2.2 hours. The mean temperature of the soil at 9 a.m. was 40.1° at a depth of 1 foot; at a depth of 4 feet it was 43.1°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J. Pilkington, Stirling, Clonee, Co. Meath; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin; Mr. F. Dudley Joynt, Donnybrook, Dublin; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin; Dr. Arthur S. Goff, Dundrum, Co. Dublin; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow; Mrs. Sydney O'Sullivan, Auburn, Greystones; Dr. F. O'B. Kennedy, Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 1.65 inches, on 16 days. Average, 2.02 inches on 16 days. Maximum in 24 hours, 0.33 inch on 5th. In February, 1904, 4.04 inches fell; in February, 1909, only 0.46 inch of rain was recorded. Maximal temperature in shade, 46.4° on 16th; minimum, 27.7° on 28th.

Days of frost in shade, 6; of frost on grass, 16.

Malahide.—Rainfall, 1.09 inches, on 11 days. Maximum, 0.135 inch on 6th.

Clonee.—Rainfall, 1.82 inches, on 15 days. Maximum, 0.32 inch on 5th. Rainfall since January 1, 6.07 inches on 43 days.

Phœnix Park.—Rainfall, 1.50 inches, on 17 days. Maximum, 0.31 inch on 4th. Total amount of sunshine was 81.5 hours, the most being 7.9 hours on 9th and 24th.

Cheeverstown.—Rainfall, 1.33 inches.

Donnybrook.—Rainfall, 1.330 inches, on 13 days. Maximum, 0.255 inch on 5th.

Ranelagh —

Mean corrected Height of Barometer	29.754 inches
Highest corrected Reading (9th, 9 hours)	30.59 ,,
Lowest corrected Reading (20th, 9 hours)	28.93 ,,
Mean Dry-bulb Temperature	38.5°
Mean Wet-bulb Temperature	37.3°
Mean Vapour Pressure	0.209 inch
Mean Humidity	90 per cent.
Mean Maximal Temperature	43.9°

Mean Minimal Temperature	34.6°
Arithmetical Mean Temperature	39.3°
Highest Temperature in Screen (21st)	49°
Lowest Temperature in Screen (28th)	25°
Lowest Temperature on Grass (28th)	12°
Nights of Ground Frost	17
Rainfall (on 14 days)	1.16 inch
Greatest Daily Rainfall (5th)	0.26 inch
Mean Amount of Cloud	61.4 per cent.
Days of Clear Sky	8
Days of Overcast Sky	15
General Directions of Wind	S.E. to E.

Remarks.—A cold month, with many damp, overcast days. Maximal temperature never reached 50°, and was below 40° on four days. The prevalence of S.E. to E. winds was also unusual.

Dundrum.—Rainfall, 1.96 inches, on 18 days. Maximum 0.30 inch on 4th. Mean shade temperature, 40.4°; maximum, 57° on 11th; minimum, 25° on 28th. Hail showers on 3rd, 25th, and 26th.

Killiney.—Rainfall, 1.78 inches on 12 days. Maximum, 0.30 inch on 4th. Average at Cloncevin, Killiney (24 years, 1885-1908), 1.752 inches on 14 days.

Greystones (Rathdown House).—Rainfall, 3.92 inches on 17 days. Maximum, 0.76 inch on 18th. On the 14th, 0.60 inch was measured, and 0.42 inch on the 19th.

Greystones (Auburn).—Rainfall, 2.97 inches on 17 days. Maximum, 0.41 inch on 19th, and again on 26th.

Newcastle.—Rainfall, 4.07 inches on 17 days. Maximum, 0.50 inch on 3rd. Mean temperature, 38.5°; maximum, 47° on 28th; minimum, 28° on 22nd and 24th; mean maximum, 43.0°; mean minimum, 34.°.

Enniskymon.—Rainfall, 2.56 inches on 13 days. Maximum, 0.41 inch on 6th.

Castleconnell.—Rainfall, 1.67 inches on 8 days. Maximum, 0.46 inch on 13th.

Dunmanway.—Rainfall, 5.76 inches on 15 days. Maximum, 0.95 inch on 21st. Besides this, 0.92 inch fell on 18th, 0.75 inch on 3rd, 0.66 inch on the 4th and again on the 6th, and 0.65 inch on the 28th. The observer writes:—"With the exception of these days, it was a fine, hard, cold month, with frequent frosts. Cold S.E. winds prevailed, varying to E. and N.E. No snow. Brilliant aurora borealis on the nights of the 23rd and 27th. No rain fell from the 7th to the 11th, the 22nd to the 24th, or on the 26th and 27th."

In Memoriam.

CHARLES MOLYNEUX BENSON, M.D., B.A., Univ. Dubl.: F.R.C.S.I.: Surgeon to Sir Patrick Dun's Hospital, Dublin.

With deep regret and a keen sense of personal loss we have to record the death at his residence, 72 Lower Baggot Street, Dublin, of this able and popular member of the Medical profession. Charles Molyneux Benson passed to his rest in the forty-second year of his age, after a few days' illness of influenza and pneumonia, on Sunday, February 16th, 1919.

Born in India, a scion of a family well known and highly respected in Dublin, Charles Benson spent his early childhood in that great dependency of the British Empire. In accordance with custom, he came home and was educated at Rathmines School and in Trinity College, Dublin. In the Spring Commencements of the University of Dublin in 1900 he graduated in Arts. Two years later he took his degrees in Medicine, Surgery, and Midwifery, having completed his medical curriculum in the School of Physic and at the Royal City of Dublin Hospital. In 1904, the degree of Doctor of Medicine in the University of Dublin was conferred upon him, and in 1906 he was admitted a Fellow of the Royal College of Surgeons in Ireland. Shortly after this last date he was appointed Anæsthetist to Sir Patrick Dun's Hospital, to which he subsequently became Assistant Surgeon, and, finally, on the death of Sir Charles Bent Ball, Bart., early in 1916, full Surgeon. He was also one of the Anæsthetists to the Dental Hospital of Ireland.

Two important posts of trust were filled by Charles Benson with conspicuous success up to his unexpected, and—humanly speaking—untimely, death. He was Secretary to the Council of the Royal College of Surgeons in Ireland, and Acting Secretary to the Royal Medical

Benevolent Fund Society of Ireland. These appointments brought him into close relations with his professional brethren all over the country, and in connection with the latter the widows and orphans of medical men will hold his memory in grateful remembrance for many a day.

In 1915-1916, CHARLES BENSON was President of the Dublin University Biological Association. The subject of his Presidential Address, delivered on November 20th, 1915, was "The Effect of the War on the Medical Profession." It was published in the number of this Journal for February, 1916 (Volume 141, page 85).

In 1917-1918, CHARLES BENSON served for a specified time as Surgeon to the Dublin General Hospital at Boulogne—an institution to which Lieutenant-General Sir Charles Burtchaell, K.C.B., C.M.G., Director-General of the Medical Services of the British Armies in France, paid a glowing tribute of praise on the occasion of a recent visit to Dublin.

"CHARLIE" BENSON, as he was familiarly called by his many friends, was of a singularly attractive disposition, in character "as straight as a rush," an upright and conscientious man, respected by all who knew him. His death leaves a great blank in medical circles in Dublin. Our heartfelt sympathy goes out to his young widow and little children, one of whom nearly lost his life from the fell malady which killed his father; also to Sir Ralph and Lady Benson, who for the second time within a brief space have been called on to mourn the loss of a beloved and loving child.

J. W. M.

THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

MAY 1, 1919.

PART I.

ORIGINAL COMMUNICATIONS.

ART. XII.—*On Skin-Stains and Hair-Dyes.*[a] By WALTER G. SMITH, M.D.; ex-President, R.C.P.I.; Physician to Sir P. Dun's Hospital.

PART I.—SKIN-STAINS.

I PROPOSE to offer a few remarks upon certain skin-stains and hair-dyes, and to illustrate them by specimens and by simple experiments.

The scope of my paper will be limited almost exclusively to the horny structures, as exemplified in the upper epidermis and in the hair.

Histological methods are fully discussed in various text-books, and especially in Unna's interesting and original monograph, "Die Biochemie der Haut," 1913, with a marvellous wealth of minute observation, based upon accurate chemical knowledge. I am much indebted to this book in the preparation of these notes.

In passing, however, I may observe that some of his views upon the chemical reactions of the cells of the deeper layers of the skin, and upon the surface reactions of the skin, appear to me to be speculative, and open to question.

[a] Read before the Biological Club, January, 1919. Section on Hair Dyes read before the Medical Section, Royal Academy of Medicine, April, 1919.

The purely chemical discussion of micro-chemical stains is elaborately treated in Pappenheim's book, "Grundriss der Farbchemie."

The relations between colour and chemical constitution are discussed in a recent volume by Watson.

With the exception of fat, all the tissues of the skin and its belongings are composed of proteins and their derivatives.

Now we know that proteins are essentially built up of linked chains of some 18-20 amino-acids, and that different proteins contain widely different amounts of the various amino-acids.

For example, egg-albumin yields 6 parts of leucin, compared with 20 parts furnished by serum-albumin. Again, gelatine yields no tryptophane, cystin, or tyrosin, and, hence, fails to react with Millon's fluid.

The sulphur content of proteins is locked up mainly in the form of cystin. The sulphur cannot be directly tested for, but is easily detected by boiling with an alkaline solution of oxide of lead. Some of the sulphur is split off by the alkali, and produces alkaline sulphide, which then reacts with the PbO, and forms black sulphide of lead.

In considering the action of drugs and stains upon the hair and upon the surface of the skin, the following points suggest themselves, but time forbids my dwelling upon all of them :—

(1) The reaction of the surface, as tested by indicators.
(2) The fatty matters of the skin and of its glands.
(3) The proteins of the cells and their sclero-protein derivatives.
(4) The operations of reduction and oxidation.
(5) The pigments of the skin.

We will start with the fundamental principle that the mode or manner of action of drugs and stains is of a physico-chemical nature—*e.g.*, adsorption, absorption, and chemical inter-action. The chemical action is largely one of reduction; oxidation plays a minor part.

(1) *Reaction of the Surface of the Skin as tested by*

Indicators.—After many contradictory statements, it is now well established that the intrinsic reaction of the purified normal healthy epidermis, apart from sweat and fat, is feebly acidic. Not until the papillary layer is reached do we get a weak alkaline reaction, due to the active blood-circulation.

The acid reaction is readily demonstrated by litmus, or, better still, by reddened phenol-phthalein, and is exhibited both by living and by dead epidermis. Unna recommends a solution termed Nile red, for the composition of which I refer to his monograph. Neither Dr. Alfred Scott nor myself find this reagent satisfactory, and it may be dismissed as superfluous. It is turned blue by acids. Neither cotton nor white wool responds to it. White filter paper is blued by it.

Over and above the epidermal reaction we have to note that the *surface* sweat is also normally acid. This is best demonstrated on the cleansed and purified palms of the hands, which are free from sebaceous glands.

Only when sweating is profuse—*e.g.*, after a Turkish bath or a hypodermic injection of pilocarpin—does the primary feebly alkaline reaction of the glomerular secretion suffice to overcome the intrinsic acidic quality of the horny epidermis through which it wends its way, and in such cases the surface sweat may react neutral or even feebly alkaline to indicators.

(2) *The Fatty Matters of the Skin and its Appendages.*—The cutaneous fats belong to two groups: (*a*) Glycerin fats; (*b*) cholesterin fats.

The glycerin fats are the common ones—viz., olein, palmitin, and stearin.

The cholesterin fat is, according to Unna, chiefly oleate of cholesterin, and along with it some free cholesterin is found. Human fat does not, as has been asserted, include lanolin, which is an oleic ester of *iso*-cholesterin.

Pathologically, accumulations of cholesterin and cholesterin esters occur in the yellow patches and nodules of xanthoma, in which affection crystals of cholesterin have been detected.

The yellow colour of the scales of seborrheic eczema also appears to be due to cholesterin esters.

In human skin cholesterin is found mainly in the younger epithelium, the hair-follicles, coil-glands and sebaceous glands. In the secretion fats, in contact with air, cholesterin is partly changed into oxy-cholesterin.

The *vernix caseosa* of the new-born child is not a secretion fat, and has nothing to do with the sebaceous glands. It consists of loosened, fatty horn-cells accumulated during the sixth to the eighth month of fœtal life, and is rich in glycogen. The cell-fat of ear wax contains very little cholesterin.

The secretion skin fats are liable to become rancid and irritating: witness the evil odour of the contents of sebaceous cysts, and of large comedones when squeezed out. The odour recalls that of butyric acid, and is probably due to the production of minute quantities of this malodorous acid.

The uninjured skin is a greasy colloidal envelope to the body, and this greasiness is the main cause of its reluctance or refusal to absorb water or aqueous solutions of non-volatile salts, *pace* the balneologists. Water cannot thoroughly "wet" the skin in the physical sense of the word.

Per contra, surgeons utilise the solvent action of ether upon fats in cleansing the skin prior to operation, and thus freeing it from grease, which entangles bacteria.

Similarly, a solution of $AgNO_3$ in spirit of ether is more efficacious than aqueous solution of $AgNO_3$ in the treatment of eczematous affections of the skin, because the silver salt is thus brought into more intimate contact with the diseased surface.

Unna holds that the sweat-glands secrete fat, but his arguments are not convincing, and Dr. Wallace Beatty's careful researches, published in 1892 (*British Journal of Dermatology*, No. 54, Vol. V.), proved the unreliability of Unna's position.

(3) *Proteins and their Derivatives.*—In this connection we are concerned not so much with the primary cell-poteins

as with certain of their cleavage-products, known as scleroproteins. I will briefly refer to three of these, viz. :—

(*a*) *Collagen*.—The ground substance of white fibrous tissue.

(*b*) *Elastin*.—The constituent of yellow elastic tissue.

(*c*). *Keratins*.—The group of bodies constituting the essential part of hair, horny epidermis, nails, and horn.

We can best visualise the transformation of cell-proteins into one or other of these three bodies by regarding it as, in essence, consisting in the dissociation and translocation of certain amino-acids from the interior of the cell, the result of a sort of autolysis or self-digestion.

Further, collagen alone, when boiled with water, is the only one of these three which, when hydrolysed, gives off NH_3 and is converted into gelatin.

Collagen is the product of connective tissue-cells and is the parent of elastin, a substance that offers great resistance to chemical solvents, and is incapable of peptic or tryptic digestion.

Elastin is the final transformation product of collagen, and when excessive formation of collagen occurs—*e.g.*, scars, cheloid, and fibroma—elastin is no longer formed. This absence of elastic tissue in scars is easily appreciated by touch.

The subjoined Table, compiled from Unna, exhibits some of the points of contrast between collagen, elastin and keratin :—

Collagen	Elastin	Keratin
Does not yield the strongly reducing amino-acids, cystin, tyrosin, and tryptophane. The basic amino-acids preponderate—*e.g.*, arginin and lysin. Hence, it stains best with acid dyes No sulphur No tyrosin	Yields very small amounts of basic amino-acids, lysin, arginin, histidin. Yields much leucin, alanin, and phenylalanin. Reacts decidedly acid, and is feebly reducing. No sulphur Tyrosin, 0.34 %	Yield less leucin than elastin, and much more tyrosin, 2.9 to 4.6 %. Are strongly reducing owing to high proportion of tyrosin. Yield much cystin. 15 % sulphur in human hair

When collagen is present in large amount the formation of elastin recedes, as can be noted in scars and cheloid growths. That the surface of a scar behaves differently, as one might expect, from the surface of adjoining skin is shown by some observations which I recently made.

A girl upon whom I had successfully operated a year ago for extensive lupus in various parts of the body returned to hospital for further treatment this autumn.

Large white flexible scars level with the skin, resulting from the previous operation, existed on the abdomen, arms, chest and knee.

The abdominal scar and the surrounding skin were painted with carbol-fuchsin. The stain was left on for 24 hours. When thoroughly washed the next day, the colour was entirely removed from the healthy skin, but the scar was stained bright red, specially visible in the minute creases and furrows of the skin. The red colour persisted for more than a fortnight. I tried other stains—*e.g.*, eosin, gentian violet, and picric acid—but none of these gave such good results as picro-carmine.

Of the three sclero-proteins, the Keratin group is that which is chiefly concerned with the present paper.

Epidermis.—The epidermal cells are keratinised (Keratin A) only on the surface, and still include some soluble protoplasmic substances, which can be removed by digestion with pepsin and HCl. The prickle-cells undergo a process of autolysis, due to a tryptic ferment, and as a result of this, certain of the amino-acids wander from the interior of the cells outwards.

Nail.—The nail-cells are wholly converted into Keratin B, and are unaffected by pepsin and HCl. Keratin B is soluble in dilute alkalies.

Hair.—The hair-shaft is a complex structure, and contains a modified keratin (Keratin C), which is insoluble in fuming HNO_3.

The process of keratinisation is characterised by a marked increase of tyrosin in the horn-substance, and tyrosin is, therefore, an essential concomitant of horn-tissue. The presence of tyrosin is answerable for the

response of certain proteins : (*a*) to Xanthoproteic test, with HNO_3 ; (*b*) to Millon's test, with $Hg(NO_3)_2$.

Among the amino-acids derivable from proteins, tyrosin possesses the highest reducing power.

The sulphur-content of the keratins is locked up, mainly in the form of cystin, and can be demonstrated in the way already mentioned.

Tryptophane can also be shown to exist in horn shavings but not in hair (*cf.* Unna, p. 73).

(4) *Reducing Power of the Skin.*—Living animal tissues in general are strongly reducing agents, and by suitable reagents a descending scale of reducing power can be shown to run from the horny epidermis and root-sheaths of the hair to the deeper layers of muscles, nerves, collagen, and mast-cells, down to the nuclei of the cells, which, according to Unna, give off free oxygen.

The production of oxygen in the deeper cells depends upon the presence of oxygen-ferments, which exercise the power of "activating" the molecular inactive oxygen brought by the blood-plasma to the cells.

Every medical man is familiar with the reducing action of the skin, as shown by the blackening of $AgNO_3$ and the decoloration of $KMnO_4$.

Hence also the reason why the surface of the skin is readily attacked by strong oxidisers—*e.g.*, HNO_3, CrO_3, picric acid, &c.—and is thereby firmly stained.

Unna has introduced a substance termed *chrysophan yellow* as a reduction test. It stains reducing bodies red. "Chrysophan yellow" is a 1 per cent. solution of nitrochrysophanic acid in xylol, with the addition of an equal amount of liquid paraffin. Alkalies also turn it red, but their presence, if suspected, can be nullified by a little glacial acetic acid.

The reduction power of the skin surface runs *pari passu* with its acidity, and is chiefly due to tyrosin. In these experiments the skin should first be cleansed by soap and water, followed by alcohol and ether.

(5) *Oxidising Power of the Skin.*—Processes of oxidation and reduction do not mutually exclude each other.

Oxidation is much more feebly expressed than the process of reduction in the skin.

Unna uses Rongalite white for demonstration purposes, but I have not found it a reliable reagent. Dr. J. A. Scott kindly prepared this solution for me, and it has kept well. The sample obtained from Germany had turned blue in the bottle. Rongalite white is a solution of 1 part methylene blue and 2 parts Rongalite,[a] decolorised by HCl.

Upon the oxidising power of the horny layer moistened by the sweat depends the beneficial action of chrysarobin and pyrogallol in psoriasis and other skin affections.

The oxidising power of the skin varies in different localities. As a point of considerable practical importance, we recall the special susceptibility to chrysarobin of certain regions—*e.g.*, the face, neck, and genitals, and the relative insusceptibility of such parts as the knees, elbows and limbs—which can be readily and painlessly freed from psoriasis by the use of chrysarobin.

Unna attempts to show that this oxidising power is conditioned by the presence of oleic acid in the sweat and epidermis, but the evidence he adduces appears to me to be inconclusive, and it would be odd that oleic acid should reduce O_8O_4 and oxidise chrysarobin. Pure, freshly prepared oleic acid does not exercise oxidising power.

An interesting "Study of the Biochemical Properties of Chrysarobin" has been made by three American physicians: Drs. J. F. Schamberg, G. W. Raiziss, and J. A. Kolmer (*Journal of Cutaneous Diseases*, February, 1915).

Although it is not quite clear how chrysarobin cures psoriasis, yet the observations of these gentlemen throw some light upon the question. Chrysarobin is a stable substance, not readily oxidised by exposure to air and light, either in the dry or moist state. In watery suspension it oxidises readily in the presence of alkalies, and is converted, at any rate in part, into chrysophanic acid. It can be oxidised by the proteins of the skin, or, stated con-

Note.—Rongalite, for which I am indebted to Professor Gilbert Morgan, F.R.S., is a condensation product of formalin with the Na salt of sulphoxylic acid.

versely, chrysarobin is capable of abstracting oxygen from the proteins of the skin.

Chrysarobin possesses an exceptional affinity for the keratins of the skin, and stains the skin *terra cotta* red. The patches of cured psoriasis become white.

The chemical union between chrysarobin and epidermic scales is so firm that decoloration cannot be effected, even by repeated boiling in glacial acetic acid.

The chemical union of epidermic scales and chrysarobin is firmer than that of the aniline dyes, with the possible exception of acid fuchsin.

The combination of chrysarobin with the skin appears to be accomplished while the drug is undergoing oxidation at the expense of the proteins. Chrysophanic acid, the ultimate product of its oxidation, is therapeutically inert, and I inquired into this point some years ago at the request of the General Medical Council.

It is possible that the favourable influence of chrysarobin upon psoriasis is due to chemical union and abstraction of oxygen, resulting in a restraining influence upon the proliferative power of the epithelial cells.

The characteristic mahogany-coloured stain is resident largely in the horny layer. When this layer is exfoliated the staining disappears. A small portion of the drug penetrates into the deeper epithelial cells, and even into the corium.

The action of pyrogallol on the skin can be viewed from a similar standpoint, but, unfortunately, it may, after absorption, lead to serious and even fatal results.

Experiments.

(*a*) Test for sulphur in wool and hair.
(*b*) Surface reaction of skin
(*c*) Acidic reaction of normal sweat.
(*d*) Millon's test for tyrosin in proteins.
(*e*) Decoloration of KMn_nO_4 by skin.
(*f*) Chrysophan yellow as a reduction test.
(*g*) Rongalite white as an oxidation test.
(*h*) Action of alkalies upon chrysarobin.

(*To be continued.*)

ART. XIII.—*Some Recent Cases of Encephalitis Lethargica.*[a] By JOSEPH O'CARROLL, M.D., President, R.C.P.I., and GEORGE NESBITT, M.D., F.R.C.P.I.; Physicians to the House of Industry Hospitals, Dublin.

OUR desire in reporting these cases before the Royal Academy of Medicine in Ireland is to draw attention to the existence of this remarkable disease in this country. Our experience of the condition is, so far, too small to enable us to add anything to the admirable accounts provided by a recent report to the Local Government Board of England and Wales, dealing with nearly 200 cases, and by various papers in the journals.

We are, however, impressed by the fact that the disease might be easily mistaken or overlooked, and it is with the object of assisting those who may not yet have had an opportunity of observing a case that we venture to bring forward a brief description of those we have seen.

CASE I.— Mrs. B. G., aged fifty, married, with six children, and a history of several miscarriages, was admitted to the Whitworth Hospital under the care of Dr. O'Carroll on April 8th, 1918, in a condition of partial stupor, having been sent to the hospital as a case of uræmia. Her history, as given by her daughter, was that she had enjoyed good health till about two years before, when she became somewhat "nervous," slept badly, and suffered from indigestion, biliousness, and frequent headaches. Her state of health did not, however, attract any special attention, and she carried on her ordinary household duties till four days before admission, when she was noticed to stagger on getting out of bed. She walked about her room in a slow and uncertain manner, and was inclined to drag her feet. On being questioned, she complained of not having slept, that her headache was worse than usual, that she felt a "trembling" in her limbs and body, and that her right ear was deaf and "stuffed." She continued to carry out

[a] Read before the Section of Medicine in the Royal Academy of Medicine in Ireland on Friday, February 7, 1919.

light duties in her home for the next four days, but she seemed sluggish and drowsy. She staggered in her walk, and carried her arms in a curious position, with her elbows bent and her hands dropped at the wrists.

She sat most of the day at the fire, and, though seeming drowsy, did not sleep. Next day she was so dazed and stupid that medical advice was obtained, and she was sent to hospital as stated.

On examination, the patient was found to be a well-nourished and robust woman. She was semi-comatose, her expression dull, with eyes staring vacantly, and mouth hanging open. She lay in whatever position she was placed, making no voluntary movements. Mentally, she was dull and apathetic, but when spoken to was quite able to understand and reply intelligently. Her speech was slow and indistinct. She had well-marked conjunctivitis, particularly of the right eye, her tongue was coated with a blackish fur, and her breath was fetid.

Temperature normal, pulse 100. The respiratory and circulatory systems showed nothing abnormal, but the urine, of specific gravity 1030, contained albumen in small amount, and an occasional hyaline cast was found with difficulty. No sugar was present. She was decidedly constipated. As regards the nervous system generally, no paralysis was found, but her voluntary movements were slow and incomplete, and her limbs were somewhat rigid. Knee-jerks were absent, also ankle clonus and Kernig. Plantar reflex was extensive. The cranial nerves were intact, and the ocular fundi were normal, except for a white patch near the right disc.

Cerebro-spinal fluid of normal character was withdrawn on April 9th, and the Wassermann reaction of this and also of the blood was negative.

The subsequent course of the case was tedious and uneventful. Temperature oscillated between 99° and 100° F. for a fortnight, and then settled down with a sharp rise for a few days in July, probably due to influenza. On June 24th a note was made on her chart which briefly epitomises her condition during the long period she was in hospital,

"The patient is semi-comatose and has incontinence of urine and fæces. There is some paresis of the legs. Knee-jerks, ankle clonus, and Babinski absent. Sensation unimpaired. Speech is slow, but easily understood." Most of the time she was in a condition which strongly suggested dementia, but it was remarkable how intelligently she could reply when questioned. Her condition gradually improved, and she was discharged on November 7th, though still far from well.

The diagnosis presented much difficulty, and numerous hypotheses were considered and rejected. Dr. O'Carroll considered her case for a time to be one of polio-encephalitis, but later on lectured upon her as probably a case of lethargic encephalopathy.

When seen a few days ago she seemed quite well again, and complained only of slight "numbness" in one foot.

Case II.—The next case was admitted to the Whitworth Hospital 30th August, 1918, under the care of Dr. Nesbitt.

M. S., female, aged twenty-nine, unmarried, was sent in by her employer, for whom she had been acting as nurse-attendant to an invalid gentleman. Her history was that four weeks previously she had gone to a hairdresser and had her hair shampooed. The following morning she awoke feeling ill, and she vomited. Her head felt giddy, everything seemed to move round her, and she felt inclined to stagger when walking. She was in the habit of cycling ten miles each way to her work, but for the next couple of days she was forced to take the tram. On attempting to cycle again she was so giddy that she actually fell off on the road, but she persisted at her work, and meanwhile saw a doctor. He gave her some medicine, which she said "made her so sleepy that she had to stop it," and shortly afterwards she came to hospital.

On examination she seemed to be a physically healthy young woman, but she was decidedly emotional, and her general appearance gave the impression that she was hysterical. There was nothing remarkable in her previous or

family history. She complained of intense giddiness, relieved to some extent by wearing a cardboard mask over her eyes, and she staggered very badly on trying to walk. In the intervals of her emotional outbursts she was dull and apathetic. With the exception of the cranial nerves, no definite signs were detected in the nervous system. There was no paralysis or loss of sensation. Knee-jerks were equal and very sharp, and plantar reflex was normal. The cranial nerves, however, showed marked involvement. The pupils were equal and reacted, nystagmus was present in the left eye, but absent in the right, possibly due to weakness of the ocular muscles.

Voluntary movements were very imperfect in both. The field of vision seemed extremely limited, but Dr. Cummins reported the fundus to be normal in both eyes. There was distinct paresis of the facial nerve in the right side. The urine was normal. She was constipated, and her pulse was curiously slow (50) but quite regular. On September 3rd lumbar puncture was performed, and 20 c.cs. of clear fluid were withdrawn under somewhat increased pressure. It was reported to contain nothing pathological. Diagnosis in this case was also at the time obscure, and though an organic cerebral or cerebellar lesion was feared, an unsatisfying label of hysteria was adopted.

On September 9th it was noted that she complained of headache for the first time, but the giddiness was much less, and she was not distressed by looking at objects round her. The eye symptoms had also improved, paresis was less marked, and the nystagmus in the left eye had disappeared. The visual field had increased considerably. On September 23rd she had improved still further; she was less giddy, could walk better, and was much brighter and more natural in manner. On October 11th—*i.e.*, ten weeks from the onset of symptoms—she was allowed to go home at her own request, with instructions to have a prolonged rest.

The latest news of her (on February 4th, 1919) is that she is now perfectly well. She had a bad attack of in-

fluenza towards the end of November. The giddiness persisted for some time after leaving hospital, but all her symptoms cleared up as she recovered from the influenza.

Case III.—Mrs. X., aged forty-eight, was seen by Dr. O'Carroll in consultation with another physician on January 20th, 1919. He has kindly supplied notes of the case. He first saw her on January 16th. Owing to anxiety as to the health of relatives and to general war-strain, she had been somewhat neurasthenic for the past four years. She had had "swimming in the head"; a tendency to fall, and had fallen once; a dislike of closed places (claustrophobia), and unwillingness to go into society. At this initial visit she complained only of feeling nervous. Her pulse-rate was 100. No thyroid enlargement. On the 17th of January she came into Dublin on business, fell ill, had diplopia in the street. In the evening, having gone to bed on her return, she felt chilly; temperature 102°, pulse 116. There was slight right occipital headache. The face was flushed, and she was constipated. Laxatives and aspirin.

January 18th.—The occipital headache had disappeared. No diplopia, but the eyes felt "dazed and unnatural." She could open them, but they soon closed of themselves. She felt very tired and sleepy. The pupils behaved normally. No obvious defect of eye movements. Knee-jerks smart; no ankle clonus; plantar reflex normal; no neck stiffness. Temperature 101° to 102°.

January 19th.—More sleepy; but she sat up in bed and read both large and small print presented to her, saying, however, that her eyes were dazed. No diplopia. She dozes off, and then begins to talk to herself and smile. Perfect euphoria; "willing to get up and go for a walk"; rather annoyed at all the fuss being made about her.

January 20th.—Dr. O'Carroll saw her late in the evening; he thought there was some ocular inco-ordination, the eyes not moving to right or left after the finger as much as they should move normally. It appeared as if the muscles refused the extra effort, but the patient professed

to see the finger long after it had passed laterally quite out of the normal range of vision. That she really did not see even as far as the normal range was proved by her not recognising the number of fingers held up. Her mental condition was much as described on the 19th, but slightly duller. She was amiable; attempted to be helpful; made no complaint whatever. The eyelids were heavy, and tended to close at any pause in the examination: but as it was fairly continuous there was no opportunity of observing any talking to herself. The reflexes were as already observed. No stiffness of the neck; no decided knee-extension resistance, though a slight degree of it could not be absolutely excluded. It certainly provoked no pain. Earlier in the day her sense of orientation appears to have been defective inasmuch as she thought she had her hat and veil on, or perhaps this was a simple paræsthesia. Dr. O'Carroll suggested that the case was one of encephalitis lethargica, and advised spinal puncture for the purpose both of diagnosis and treatment. With regard to prognosis he was hopeful, basing his optimism on his experience in the very grave hospital case of Mrs. G., and on the mortality record of about 20 per cent. as given in the English Local Government Report, abstracted in the *British Medical Journal* of January 11th. He did not see the case after this visit. The medical attendant's note continues the history.

January 21st.—Some stiffness of the neck and left leg. Very sleepy. Pulse and temperature as before. Twitchings of face and arms. Lumbar puncture; clear fluid under considerable pressure, and several drachms.

January 22nd.—Rigidity of left arm and leg and of neck; increased mental confusion; retention of urine with wetting of bed.

January 23rd.—No change. Lumbar puncture again; a drachm or two with no pressure; catheter necessary.

January 24th.—Copious hæmorrhage in urine from this to the end. Temperature rose gradually to 105°; the pulse gradually failed, and the patient died comatose on the 26th

of January. Kernig's knee extension sign was well marked towards the end. Plantar reflex remained normal; no pulmonary complications.

At the consultation on January 20th we had decided against the use of hexamine, as the *British Medical Journal* abstract stated that it was supposed to be responsible for hæmaturia in several of the English cases. At a subsequent consultation with another physician it was prescribed in 10-grain doses three times a day. Whether as a mere sequence or a consequence, copious hæmorrhage occurred two days later. The doctor in charge of the case is satisfied that the case was so manifestly on the down grade that the hæmaturia had no significance with regard to the fatal issue.

Case IV.—Mr. D. M., aged sixty-eight, widower, was first seen by one of us (G. E. N.) on January 18th, 1919. He was in bed in his own home, and complained that a few days previously he had developed intense pain of a tingling nature in three fingers of his right hand. He stayed in bed for a day, but the day before advice was sought he had been out as usual. In the evening he felt chilly, and took to bed again. He had always been a healthy man, though his family said he was inclined to be nervous and sometimes irritable. With the exception of a slight attack of influenza last autumn, no history of definite illness could be obtained. He complained of nothing except the pain in his fingers, which he said was then nearly gone, and he seemed inclined to consider a medical visit somewhat unnecessary. He had no headache, no cough, or other common symptom. On examination, his temperature was found to be 100.8°, pulse 100, and rather low tension (120 mm. Hg). The urine of febrile type contained a trace of albumen, but the case was curiously negative as regards physical findings. His speech seemed, however, somewhat thick and drawling, but when the attention of his family was drawn to this point they were not sure that there was any definite alteration. His temperature fell the following morning to 98°, but rose in the evening to 103°, and when

seen the following day was 101°. He was said to have slept a great deal in the interval. His hand had ceased to trouble him, and he complained of nothing—in fact, said he was very well. Next day his tendency to sleep had become remarkable, so much so that his daughter jokingly remarked that "he must have sleeping sickness." This remark suddenly suggested a possible diagnosis. He lay in bed in a perfectly passive attitude, with his eyes closed and a "mask-like" expression on his face. In addition, a slight tremor of the right hand made one think of paralysis agitans. On speaking to him he was very easily roused, and answered questions quite intelligently and clearly, except that he still slurred his speech somewhat. Immediately one ceased to talk to him he relapsed into stupor. This condition of apparent stupor, from which he could be so easily roused only to relapse again at once, presented a remarkable and hitherto unfamiliar picture. That night, and to some extent during the previous one; he was decidedly delirious, though not at all violent, his nocturnal state contrasting forcibly with his apathy during the day. On January 22nd we saw him together, and examined him again very fully. His mental condition was unchanged—if anything more drowsy and lethargic. When roused he spoke quite sensibly, and denied any pain or other symptom. Though definite ptosis could hardly be said to be present, he opened his eyes but seldom, and never fully. The pupils were equal—somewhat contracted and reacting. Very small range of movement of the eyeballs could be elicited, though frequent attempts were made to induce him to look in various directions. There was no strabismus. The visual fields seemed normal. The facial muscles appeared weak, and the expression was certainly "fixed," but no definite paralysis was present. There was some slight rigidity of the neck, but no pain on flexing the head. The limbs were relaxed, but there was no paralysis. Knee-jerks just present; no Babinski or ankle clonus. Sensation seemed in abeyance. He signified that he felt but did not resent painful stimuli. A non-painful Kernig

was present. The bladder was normal, and the bowels had been made to act with some difficulty. Circulatory and respiratory systems showed nothing abnormal. Tongue was dry and brownish, and teeth were septic.

Lumbar puncture was performed, and about 30 c.cs. of clear fluid under considerably increased pressure were withdrawn. Subsequent examination of this fluid showed nothing abnormal—in fact, Dr. Pollock described the fluid as " more normal than normal," with no excess of protein or lymphocytes.

We agreed that the features of the case were remarkable —were different from those of any condition with which we were familiar, and it was a noteworthy fact that a precisely similar picture had been encountered by one of us (J. O'C.) two days before in the case described above. We made a diagnosis of encephalitis lethargica, and gave a guarded, though somewhat hopeful, prognosis in view of the published figures of mortality (20 per cent.).

The further progress of the case was uniformly bad. He was again delirious that night, he began to pass under him, and his bladder was distended when seen the next morning. On rousing him even then he was able to pass water at once, but did not empty the bladder, and the catheter was required. He was becoming more stuporous, and could be roused with greater difficulty. A few crackles could be detected at the base of the left lung. By evening his colour was greyish, his pulse was quick (120) and feeble, and it was evident that he would not last long. Next morning, after a night during which he was less delirious but more comatose than the previous one, he was in profound stupor, and could not be roused. Lumbar puncture obtained a few c.cs. of clear fluid. He died a few hours later (January 24th), the acute part of his illness having lasted almost exactly one week.

These cases seem to be undoubted examples of the disease which, on its appearance in England last February, was described as "Botulism" or "Infectious Ophthalmoplegia." The outbreak was very thoroughly investi-

gated by the Local Government Board, the London County Council, and the Medical Research Committee, working in conjunction, and the results were recently published in an exhaustive report, to which Drs. James, MacNalty, and McIntosh, and Professor Marinesco are the chief contributors.

They conclude that the disease has nothing to do with botulism—that it is the same condition as was described by Von Economo in Austria, and Professor Netter in Paris in 1917, under the name "Encephalitis Lethargica," and that, though it presents some features resembling polioencephalitis, it is "a disease *sui generis* anatomically and clinically distinct from analogous affections."

It is not possible at present to discuss the many interesting points in this report, or to give even a *résumé* of the mass of information detailed therein. An excellent summary will be found in the *British Medical Journal* of January 11th, 1919 (page 45). The cases we have just described appear to be typical, and Dr. MacNalty sums up the diagnostic features as follows (page 31) :—

"*In the prodromal period.*—An initial catarrhal affection, particularly conjunctivitis, may be suggestive. A change in the patient's mental attitude, taking the form of emotional changes, apathy, or extreme restlessness, progressive lethargy, and drowsiness indicate the possibility of the disease. If these symptoms are accompanied by headache, vertigo, asthenia, diplopia, and diminished visual activity, the possibility is further strengthened.

"*In the acute illness.*—The initial period of pyrexia, the characteristic attitude and mask-like face, the profound stupor, from which the patient can usually be aroused, and its alternation in the early stages with delirium, the asthenia, the rigidity, the emotional characteristics, the speech changes, retention of urine, tremors, early vomiting, and obstinate constipation are typical of the disease. The occasional presence of transient rashes may be helpful. Transient remission periods in the disease should be remembered."

In the types presenting localising nervous signs, the progressive nature of the paralysis is most important. The clearing of one paralysis and the advent of another is to be looked for, as is also the frequency of bilateral lesions which, however, are never truly symmetrical, being more marked on one side than another. The transient nature of cranial nerve paralysis when present is almost conclusive. The frequency of ptosis, paralysis of the ocular muscles, diplopia, facial paralysis, and ocular incoordination are of value.

When the rarity of bilateral facial paralysis in other forms of nervous disease, and its frequent occurrence in encephalitis are remembered, the presence of this sign is an additional aid to diagnosis.

A negative sign of value is the absence of optic neuritis.

Prognosis is said to be better than the alarming state of the patient would suggest. Among 160 cases in England there were 37 deaths.

Valuable pathological work was done in these cases by Professor Marinesco, who, ten years ago, himself described the changes in botulism. The naked-eye-findings are slight and consist mainly of minute hæmorrhages in the neighbourhood of the pons and fourth ventricle. Microscopically, chief features were perivascular infiltration with round cells, capillary hæmorrhages, and thrombosis of small vessels, the changes being, in his opinion, inflammatory in nature with a striking resemblance to those of sleeping sickness described by Mott in 1899.

Bacteriological examination has not yet given any definite positive results, though Von Economo states the finding of a diplo-streptococcus in the cases examined by him.

Finally, till the virus is discovered and specific methods obtained, treatment is mainly symptomatic. The use of hexamine in large doses is inadvisable on account of its liability to cause hæmaturia.

ART. XIV.—*Alternation of Generations and its Bearings upon Cancer.* By J. BEARD, D.Sc., University Lecturer in Cytology and Comparative Embryology, Edinburgh.

By the courtesy of the author, a copy of Dr. Crofton's short, interesting article [a] upon the "Theory of Alternation of Generations, &c.," has reached me, and this invites, by its actual contents, notice upon one or two points.

Abderhalden's book, "Schutzfermente des tierischen Organismus" (Berlin, Springer, 1912), which is cited by Dr. Crofton, is, in my opinion, a highly scientific production, and it is one from which it would be impossible for any opponent of my embryological conclusions as to cancer and the *rôle* of pancreatic ferments in its treatment to cite anything adverse to any statements of mine ever printed with reference to cancer and its treatment. Indeed, Abderhalden's work and conclusions might be quoted as supporting from the purely stereo-chemical side my embryological work, and later my stereo-chemical conclusions upon the problems of cancer. Unquestionably, I should have done this had Abderhalden's book appeared before my own work, "The Enzyme Treatment of Cancer" (London: Chatto & Windus, 1911). A point in Dr. Crofton's paper open to challenge is the statement on page 2 that "Abderhalden was very nearly right" in his test for pregnancy, for, as it seems to me, Dr. Crofton is assuming the German professor to have been ignorant that the "foreign albumin" used in his test was really that of the chorionic villi. As a fact, on page viii of the preface, and on page 76 of his book, he states this clearly. This, however, may not be taken to mean that I do not agree with Dr. Crofton, when, at the end of his paper, he says that chorionic (*i.e.*, trophoblastic) villi should be used as the substrate. It cannot

[a] Crofton, W. M.—Beard's Theory of the Alternation of Generations and the Abderhalden Pregnancy Reactions. A Criticism in Dublin Jour. Medical Science, Jan., 1919.

be other than highly satisfactory to read that Dr. Crofton[a] thinks the theory of the trophoblastic (asexual) nature of cancer to be " quite the most attractive—at present before us." Most certainly it is, as it also is the only possible true theory of cancer, but " unfortunately " he adds I have been led astray to advocate in its treatment the pancreatic ferments, instead of the internal secretion of the pancreas-gland. This is a somewhat novel suggestion, although long ago the doings of others, making use of pepsin, papayotin, &c., in fact, of any other ferment except the two, which *for scientific reasons* I had urged the employment of, were a good demonstration, that trypsin and amylopsin were not going to have it all their own way, if *empirically* some other ferment, animal or vegetable, could be found to have some action upon living cancer-cells. The term " unfortunately " might well be applied to these mistaken ideas, which had no better scientific basis than the advocacy of trypsin in cancer, because of its supposed action in " dis-

[a] On page 3, referring to alternation of generations, Dr. Crofton writes : " According to Beard the cells of one generation can live at the expense of the other—that is, their ferments can hydrolyse the protein of the other. As the fœtus grows the chorionic villi, &c., disappear, being used up in the development of the fœtus." Now, I do not agree with either of these statements. Certainly, all that at present can be said is that the ferments of the one generation under given circumstances can pull down, hydrolyse, the stereo-chemical products of the other, even in the living condition, but this is a very different thing from living upon the products. Digestion and assimilation are not synonymous. There is no evidence of the existence of any *inverting* ferment in the *sexual* generations, a point in which they differ very greatly from the *asexual* generations, such as cancer. I have never said, and I do not believe, that the chorionic villi, or the products produced by the pulling down of the chorionic villi, are " used up in the development of the fœtus." In this respect my conclusions, being based strictly upon the available evidences, differ markedly from those advanced by, for example, Professor Arthur Robinson in his Hunterian Lectures (*Jour. Anat. and Physiol.* Vol. 38, 1904, page 17). This author states, that " trophoblast is the chief means by which provision is made for the nutrition of the ovum and the embryo, not only in the early but in the later stages of the development." To my knowledge, there are no embryological facts supporting these statements.

solving " glycogen, which water also does. The reasons upon which I advocated the use of trypsin and amylopsin in years now long past—reasons which I have since more than once reinforced from the stereo-chemical side—are to-day just as cogent and scientific as they ever were. In past years they have never been impugned, and, indeed, no one can ever show them to have been wrong. It is no refutation to take, as was done by certain official researchers, a solution, labelled " trypsin," and then, after injecting it in vain into a mouse with a tumour "about as big as itself," to declare that trypsin had no action on living cancer-cells. In this procedure there was one serious defect in the " scientific " experiment. The label does not satisfy any chemical criterion : the solution used (which in this case was to all intents only glycerine and water) must be shown beforehand to be chemically active—that is, to contain, and how many units, active trypsin. If experiments with supposed, but fictitious, ferments are to be carried out in official laboratories without the observance of the rules adopted in all scientific chemical laboratories, then there would appear to be no valid reason for the continuation of such sterile institutions ; they might just as well, for the sake of economy, be closed, and the official salaries be paid to the holders of the appointments without asking them to " test " the action of substances, such as trypsin, while paying no attention whatever to anything except the mendacious label on the bottle.

But now to put a crucial question. What grounds, scientific or other, exist for the opinion expressed by Dr. Crofton? There are no reasons given by Dr. Crofton, and answering my query myself I am bound to assert that his opinion is unsupported in the literature of science by any grounds whatsoever, if one except the many failures of trypsin and amylopsin to effect a cure. To this latter matter reference shall be made presently. My opinion of the " internal secretion " of the pancreas-gland is, that at present it stands in exactly the same position as the gland itself did prior to Corvisart's researches in 1857, when

physiologists and physicians alike held that it had no digestive functions whatever. It has never yet been demonstrated by anyone that the "internal secretion" of the pancreas-gland will perform any physiological work at all, but, strange to say, some eleven or twelve years ago I received from the manufacturers a small box of six tubes, hermetically sealed and labelled "Internal Secretion of the Pancreas-Gland." I have them to-day, and the contents are still as clear and limpid as they were more than ten years ago—a fact which leads me to suspect the contents to be nothing at all except glycerine and water. On receiving the tubes I asked the makers what chemical or physiological work the contents of these ampoules would do, but no answer has ever been received. I do not even know how the "internal secretion" was obtained, and can only surmise that perhaps it was an extract of something or other got from the fresh glands *after* the ferments had been extracted.

Most assuredly, I still insist, that trypsin and amylopsin, scientifically administered, are curative in cancer. In disproof of this the many failures may not be referred to, for, as the late Professor D. J. Cunningham once remarked to me, "Negative results never prove anything at all in science." There have been positive results, successes, even within the past year. Once again I may refer to the successful case, cited (page 209, *et seq.*) and illustrated in my book, of the York ex-drummer (round-celled sarcoma), cured in 1909—nearly ten years ago. Since 1911, although I have repeatedly invited a medical examination and test of this case, not a single medical man has asked to see the photographs, the charts, and the diagnostic section of the tumour. Once only *a medical student* of my acquaintance did express a desire to see, and did examine for himself, this microscopical section, but after seeing it he made no comment. If Dr. Crofton's use of the term "unfortunately" is justifiable, if my advocacy of trypsin and amylopsin for the treatment of malignant growths was wrong, why should there have been even a single success? Speaking

scientifically, I do not feel in the least concerned about more recent successful cases, when the crucial case, to produce the evidences of which my book was written and published, should be ignored absolutely, as though the evidences, which are complete and still in my possession, had never existed. The treatment is of the nature of the chemical experiment, and any scientific chemist will be ready and willing to give the assurance that in chemistry the single positive chemical experiment is decisive.

To explain the many failures is easy. Some, even many, cases failed because the treatment was undertaken too late, for it has never been my view that trypsin and amylopsin, powerful though they be, might be considered to be a useful alternative to the Last Sacrament. There have been instances where the patients died before the preparations reached them. Other cases failed because the preparations used were, to say the least, not suitable for the treatment. This latter is not intended to be of the nature of a magic spell or incantation, and, therefore, to employ, as many, including official researchers, have done, ampoules or bottles labelled "trypsin," but actually containing either only glycerine and water, or at most a mere trace of trypsin—that is, to all intents, inactive or inert ferments—could inevitably only lead to failure. In every chemical experiment the observer is bound, first of all, to satisfy himself as to the purity, nature, and potency of his reagents. But I am now convinced that another reason of failure is to be found in the mode of giving the injections, hypodermically or intramuscularly. In my original paper in the *Lancet*, February 4, 1905, the method of treatment by means of "the secretion of that important digestive gland, the pancreas" was deliberately left without mention. "The further applications of the scientific and theoretical solution" were "left in the hands of those who know far better how to employ it." But it has always been my own opinion that the proper manner of giving the injections was intravenously, as recently advocated, with success stated in the first case

tried, by Dr. M. W. McDuffie,[a] of New York. There is now no harm in saying that it was the personal dissuasion of a former fellow-student, the late Dr. Robert Maguire, F.R.C.P., Senior Physician to the Brompton Hospital, which long prevented my advocacy of intra-venous injection.

A piece of ancient history—if it be a point worth raising, which may be doubted—mentioned by Dr. Crofton, is the supposed formation of anti-trypsin and anti-amylopsin on the injection of the two pancreatic ferments. I have never seen this referred to anywhere else since 1911, when I dealt with it very briefly on page 187 of my book. The sole evidences—save the mark!—which can be adduced for this statement are German ones, and it has all along been clear to myself and to those associated with me that the German preparations of trypsin—there never were any of amylopsin[b]—were not fit for use in any disease at all. They were impure, and these organic impurities were at the bottom of the statements made by several Germans regarding anti-trypsin. Indeed, the use of the latest modification of the German trypsin—the so-called "Carbenzyme"—had to be given up, because in one case its exhibition induced tetanus, and so led to the death of the patient. As to the existence of "anti-trypsin," the only recorded experiments are those of Dr. S. Pinkus.[c] This investigator found the following things after injecting certain un-named sterile solutions of "pancreatin preparations" in dogs and guinea-pigs: "Here one or two

[a] McDuffie, M. W.—Cancer—A new method of Treatment, in: Medical Times, New York, February, 1917, pp. 48-50.

[b] Why "anti-amylopsin" should ever be spoken of is not at all clear, for not a single one of those, who professed to find antibodies after injecting ferments, ever made use of amylopsin. Indeed, so far as scientific facts exist, these go to prove that the injection of amylopsin destroys these supposed "anti-bodies" (vide the experiments of S. Pinkus cited above).

[c] Pinkus, A und Pinkus, S.—Die Krebskrankheit und ihre therapeutische Beeinflussung durch Fermente. Sonderabdruck aus der *Medizinische Klinik*, 1907, Nos. 28 and 29, pp. 15.

injections sufficed to raise the temperature from 1° to 1.8° permanently; in all cases there was a strong local reaction, invariably leading to further necroses. Five cavies and the dog No. 4 died in eight to ten days." It is also added that all the disturbances subsided, when an injection of genuine amylopsin (Fairchild) was substituted. Finally, of the many thousands of ampoules of trypsin and amylopsin (Fairchild), which have been used, it can be affirmed that the contents of no single one have ever been found to have caused the production of either anti-trypsin or anti-amylopsin.

As to the use of " internal secretion " *versus* trypsin and amylopsin (Fairchild), this matter could easily be set at rest. But the onus of making the test is upon Dr. Crofton, not upon me, who am quite sceptical regarding any influence at all of " internal secretion " upon cancer-cells. It is, to my mind, quite probable that the firm who sent me the ampoules of " internal secretion," mentioned previously, might be willing to supply a few dozen ampoules of " internal secretion " for this test. But for myself I am so convinced that my advocacy of the all-powerful ferments trypsin and amylopsin is still, and will be for all time, the only true and scientific remedy for cancer, that I must decline to undertake any experiments at all with this dubious " internal secretion," about whose potencies nothing at all is known. It might—but this is merely a suggestion—be " tried " upon one or more mice of the Imperial Cancer Research Fund. Regarding these mice, be they scores or thousands, I would add with emphasis that while I do not know the slightest scientific reason why the said " internal secretion " of the pancreas-gland should have the least action upon the tumour-cells, if I or one of my friends were permitted to make injections into the living mice inoculated with a malignant tumour, using only a solution of Fairchild's " trypsin-amylopsin powder," in a week there would not be a single living cell of the tumour left. This statement is made in complete confidence in its absolute truth. This would, I imagine,

dispose of Dr. Crofton's theoretical view of the *rôle* of the "internal secretion" of the pancreas-gland, besides refuting from the experimental side—what from the clinical side has been done scores of times—the official untruth, that trypsin is devoid of action upon living cells of malignant tumours.

To summarise my present scientific position. In all the years which have elapsed since my Liverpool lecture of January 20, 1905, nothing has occurred to alter in the least the conviction of the absolute scientific truth of the statements, which I then first made publicly, and later on amplified, regarding the scientific nature and treatment of cancer. What in these years I have concluded upon the question is all, so far as I am aware, in print, and open to the whole world. Of the essentials I have nothing at all to withdraw. Indeed, these ferments, properly and scientifically employed, are not only the sole possible scientific treatment for cancer, but as elsewhere shown, because of quite similar or even identical scientific reasons, they are the only scientific remedies, because the natural ones, which will ever be discovered, for relapse malaria,[a] for tuberculosis, for eclampsia, and for other diseases too numerous to mention.

On page 4 Dr. Crofton remarks that "Beard's theory of cancer has come into discredit, &c.," which may be true, but which alters in no way the scientific truth of the theory or the correctness of the method of treatment advocated—to wit, by bringing into the blood of the cancer-patient the

[a] Relapse malaria is one of the simplest and easiest diseases to treat *and cure* by injections of pancreatic ferments, from one to three injections of Fairchild's "trypsin-amylopsin powder" sufficing. None the less during the recent war it was impossible to convince the War Office and the Royal Army Medical Corps that in the treatment of malaria there was any scientific alternative to quinine-poisoning. A recently demobilised Edinburgh soldier, who was long in Greece, informed me that in his brigade alone not less than 400 soldiers had been invalided home suffering from relapse malaria, each of whom could have been cured and made fit at once for further service in a few days at an expense not exceeding eighteen pence per man. So much for science in the treatment of tropical diseases.

powerful ferments trypsin and amylopsin, than which in all probability there exist no more powerful substances in the visible universe. The "discredit" is something which the theory shares with almost every other great scientific advance ever made, for scientific martyrdom is no new thing. It ought not to be forgotten that the "failures" were not mine, and that every year there are some successes. In 1906, even the first Fairchild preparations cured a very few cases. The chemist, Emil Fischer, set up one of his greatest discoveries concerning the action of ferments on the basis of a single positive experiment. True, he added a second positive experiment, but this was merely to confirm the first. The York successful case, cited in my book, was the crucial one upon which I took my stand. It has since 1909 been confirmed again and again. If, however, mankind for some reason or other is disinclined to admit the truth of my cancer-work, including the usefulness of trypsin and amylopsin in cancer, possibly it may be disposed to accept my word, that the two discoveries of greatest moment I ever made were the following :—There has been no advance in the human intellect for the past two thousand years at least, and there is no generally recognised criterion for truth in science—except human authority!

In a sense these were far-reaching discoveries, because they pointed to the fatuity of ever expecting to garner the harvest of prolonged and patient scientific investigation, but they are not in the least comparable to Emil Fischer's discovery, mentioned above, or to the finds relating to the nature and treatment of cancer.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS, IRELAND.

The following are the names of the successful candidates at the Conjoint Final Examination, held in March, 1919:—James Joseph Connolly, Christopher Thomas Cullimore, James Danaher, Thomas Norman D'Arcy, Ella Gleeson, Patrick Nicholas Hegarty, Bernard Francis Honan, Norah M'Cormick, Daniel John Francis O'Flanagan, Edmond Waide, Crawford Law Wilson.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Prothèse fonctionnelle des blessés de guerre, Troubles physiologiques et Appareillage. Par le Dr. Ducroquet, chirurgien orthopédiste de l'Hôpital Rothschild. 1 vol. de 236 pages avec 218 figures *toutes originales* (Masson et Cie., Editeurs)

Surgical Treatment to restore Function for the Wounded in War: Physiological Disturbances and Treatment by Mechanical Apparatus. By Dr. Ducroquet, Orthopædic Surgeon to the H. de Rothschild Hospital. With a Preface by Pr. Aug. Broca. Illustrated by 218 Figures in the text. Paris : Masson & Company. 1919. Cr. 8vo. Pp. 236.

Following the series of his monographs on War Orthopædics, Dr. Ducroquet now gives us a comprehensive study of the principles and applications of surgical treatment to restore function. His work is indeed an after-war book which appears at the right moment and which will prove a useful guide to medical practitioners in the opinions that they will be called upon to give in so many varied cases to our wounded for many a day to come.

The work passes in review in sequence :—

The fixation-points of a suitable apparatus; the choice of axes and of articular mechanisms; the different kinds of instruments : apparatus to secure immobilisation; apparatus for limited movements; apparatus for muscular release; apparatus for paralysis, &c.

After these mechanical considerations comes a chapter on cinematic representation of normal walking. This is just now a question very much to the point, for from it we have all the necessary data to solve the problems presented by pathological gait.

From these mechanical indications and from these functional conditions the author proceeds, in conclusion, to the practical application of his views. This is the subject of the last chapter of the book—the establishment of walking power with short, contorted, stiff, or broken limbs, &c.

As Professor Broca points out in his Preface or Introduction, it is necessary to be acquainted with the exact function of the joints in the normal state in order to understand their defects in the pathological state, and consequently the aids or possible corrections by means of certain apparatus; to know that all our natural movements take place at multiple axes, and that in consequence of this our artificial hinges will always be only approximately efficient.

The illustrations in the work comprise 218 drawings, all original, executed under the efficient direction of Dr. Ducroquet. The cost of the book is only 5 francs (four shillings).

The Action of Muscles : including Muscle Rest and Muscle Re-education. By William Colin MacKenzie, M.D., F.R.C.S., F.R.S. (Edin.). London : H. K. Lewis & Co., Ltd. 1918. Demy 8vo. Pp. xvi + 267.

The great war has drawn marked attention to the subject with which Dr. MacKenzie's book deals, and the importance of a knowledge of the actions of muscles can scarcely be exaggerated. Many new problems concerning muscular action and the re-education of muscles have received attention at the Military Orthopædic Hospitals during the last few years, and with several of these Dr. MacKenzie's interesting book deals.

The greater part of the work is devoted to the study of the results of paralysis of the various muscles and groups of muscles, and of the best means of resting and of re-educating injured muscular tissue. The great importance of rest is insisted upon, and the necessity of devising means of estimating the actual loss of power in paralysed muscle

is emphasised. Methods are described by which rest can be afforded and the gradual recovery of power can be gauged.

Dr. MacKenzie's knowledge of comparative anatomy gives him an insight into many intricate problems, and some of his deductions are of extreme interest. As a result of his observations on patients and his studies in comparative anatomy, he formulates what he regards to be the evolutionary law of muscle function. This he states as follows :—" The particular functions of any muscle are the result of the evolutionary history of that muscle." Further, he believes that as a result of treatment, the earlier and more primitive functions of injured muscle are first recovered, and the later acquired and more specialised functions only after a longer time. " The recovery, like the loss, follows in an ancestral or evolutionary sequence."

Should this interesting generalisation be established, a knowledge of comparative myology will count for much in the treatment of muscle injuries. Nevertheless, few will at present go so far as to agree with Dr. MacKenzie when he states that " it is inconceivable that anyone should attempt to handle a paralysed deltoid or quadriceps without some knowledge of its ancestral history."

In dealing with the nature of tendons and ligaments, many will believe that the author lays far too much stress upon the elasticity of these structures. Dr. MacKenzie attributes for the most part but one function to each muscle, and this leads him to conclusions which are often at variance with those usually accepted. Thus, for instance, we are told that the biceps does *not* flex the elbow, and that the extensor communis digitorum has no part in extending the middle and distal phalanges of the fingers. In the case of several other muscles, both of the arm and leg, his teaching differs from that usually given.

Books like Dr. MacKenzie's stimulate further investigation, nevertheless it would seem from his preface that he is unaware that Schools of Anatomy have for a long time been alive to the importance of a knowledge of the action

of muscles, and have recognised in the fullest manner that this entails a knowledge of the mode of action of the opposing muscle or group of muscles. The statement that he finds to be "no longer tolerable," namely, "that fifteen external rotators of the hip, including such powerful engines as psoas and great gluteus, are balanced by one muscle and part of another," is surely one which he has not heard put forward in any School of Anatomy in the United Kingdom.

The Treatment of War Wounds. By W. W. Keen, M.D., LL.D.; Major, Medical Reserve Corps, U. S. Army; Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Second Edition, reset. Philadelphia and London: W. B. Saunders Company. 1918. Pp. 276.

This is an exceedingly interesting and most readable little book. We confess to surprise at the author's approval of the following sentence, which we quote from an article upon abdominal wounds:—

"Exploration by the finger and probe should be done whenever possible." In these days it is not necessary to add, "by the carefully disinfected finger and probe."

What about the infected wound, and the almost certainty of carrying infection by the finger or probe from the infected wounds into the abdomen? With this exception, the book is excellent.

Advanced Suggestion (*Neuroinduction*). By Haydn Brown, L.R.C.P., &c. (Ed.) London: Baillière, Tindall & Cox. 1918. Cr. 8vo. Pp. viii. + 342.

Knocking down men of straw of one's own manufacture is an entertaining occupation, and the devising of new terms provides a gratifying impression of progress.

Disregarding the stages in which sleep is not present, our

author objects to "Hypnosis," which he restricts to the state of somnambulance, and to the term "Suggestion," which, according to his dictionary, means "information or hints to the mind or thoughts." He prefers "Induction, or the inference of some general truth from special facts." "But inasmuch as I include very definite effects upon sensation in every application of the system of Induction, I find the word Neuroinduction still more apposite and expressive. At the commencement . . . I make sure of general physiological relaxation as a *sine quâ non* state throughout both the mental and physical systems." Under Induction he includes clear explanations, reasonings, impressive illustrations, cogent contentions, and at times urgent adjurations. In Smith's Latin Dictionary the meanings of suggero, from which suggestion is derived, include "supply, excite, instigate, advise, bring to mind, and admonish." The abandonment of "Suggestion," therefore, seems hardly necessary, however advisable it may be to discard the terms Hypnosis and Hypnotism. Again, if hybrid terms are to be admitted, such as Neuroinduction and Autoinduction, why not use Heteroinduction instead of Alteroinduction, for the sake of uniformity.

On examination Dr. Brown's technique seems to resemble closely that of Liebault, as described by Lloyd-Tuckey. "The patient was told to take his place in an armchair and to make his mind as much a blank as possible. . . . Then the phenomena which attend the oncoming of natural sleep were gradually suggested to him. . . . The patient being more or less influenced, Dr. Liebault proceeded with the treatment proper. This consisted essentially in directing the invalid's attention to the part affected and suggesting an amelioration or disappearance of the morbid condition and symptoms. . . . The part affected was gently rubbed so that the patient's attention would be attracted to it, and he was told that the pain was to disappear. . . . The fulfilment of the first suggestion tends to augment the patient's confidence and

leads to the more ready reception of those which follow." Sensory stimulation and physical and mental relaxation were the only essentials, for "the increased force of Suggestion does not depend on the profoundness of the Sleep."

The chief difference lies in Dr. Brown's employment of Thought-analysis in immediate connection with Induction. He criticises the methods of Psychanalysis, pointing out the waste of time necessitated by them, and the quite unnecessary stress laid by their exponents on sex complexes. Unfortunately, owing presumably to lack of space, there is no very lucid exposition of his own technique in Thought-analysis.

Those who have investigated the writings of the Freudian school will appreciate Dr. Brown's denunciations of such terms as unconscious consciousness, though his endeavours to distinguish between super- and supra-conscious are not particularly happy, especially as his superconscious is more familiar as the subconscious. The relative importance of the Subconscious hardly requires to be emphasised by an alteration of the name, for it is now generally accepted that the Conscious is like an iceberg, only the summit of which appears in normal circumstances. The submerged mass is not itself apparent, but it is the foundation on which the brilliant superstructure rests; if it is disturbed the whole mass is upheaved and perhaps overwhelmed. The Conscious is One, but may not all be present to the special senses at one time.

In the process of condensation to which this work has been subjected much has had to be sacrificed that would have been of great interest to the inquirer. It is, therefore, to be hoped that Dr. Brown will soon be able to elaborate his treatise, giving more details of his technique as applied to individual cases. Those mentioned are of great interest. To the mind unfamiliar with even old-fashioned hypnotic suggestion they may seem to border on the fabulous, but most if not all of them could be duplicated by those who have practised the art.

There are only a few trivial misprints noticeable, but

owing to the omission of "is" on page 40 the reader is rather apt to get entangled in the first sentence, which runs to thirteen lines. Without becoming exclamatory it is possible to cut up such anaconda-like phrases, lesser examples of which occur with some frequency. In spite of them, however, the reader will acquire a mass of information and instruction most useful in the treatment of the great variety of conditions which are undoubtedly amenable to—Induction.

Until Dr. Brown describes more exactly how he induces relaxation most people will find the methods of Braid and Liebault the easiest to put in practice; after that it is only a matter of ingenuity and skill to make the suggestion fit the case.

A System of Clinical Medicine: Dealing with the Diagnosis, Prognosis, and Treatment of Disease. By Thomas Dixon Savill, M.D. (Lond.). Fifth Edition, thoroughly revised. Illustrated. London: Edward Arnold. 1918. Royal 8vo. Pp. xxviii + 948.

We have pleasure in drawing attention to this, the fifth, edition of Dr. Savill's Clinical Medicine, which has been thoroughly revised. The sections on the treatment of Diabetes Mellitus and Syphilis, and the chapters on Diseases of the Nervous System have been entirely re-written, the Editor having had the assistance of experts in these and other departments of Medicine.

The book differs from most text-books on Medicine in that it approaches the subject from the point of view of symptomatology, first describing the symptoms and then tracing these symptoms to their causes, namely, the various diseases which may be in operation.

The fourth edition appeared in 1914, and was reprinted two years later—a sufficient proof of the popularity of the work among senior students of Medicine and Medical Practitioners.

In consequence of the lamented death of the author,

Mrs. Savill invoked, as in the revision of the third and fourth editions, the aid of experts in several departments. The work has, therefore, been kept well abreast of modern developments in Medical Science. Among the additions in the present issue may be mentioned Spirochætosis icterohæmorrhagica, Purulent Bronchitis, Trench Fever, Delhi Boil and other rare diseases.

Dr. Harry Campbell has carried out a drastic revision of the Section on Nervous Diseases, which now forms a full monograph on the subject, occupying some 200 large octavo pages—more than one-fifth of the whole volume.

The work as it stands cannot fail to be of use to all Medical Practitioners as well as senior students. It is well illustrated, and handsomely published by Mr. Edward Arnold.

Technic of the Irrigation Treatment of Wounds by the Carrel Method. By J. DUMAS and ANNE CARREL. Authorised Translation by ADRIAN V. S. LAMBERT, M.D. London : William Heinemann (Medical Books), Ltd. 1918. Pp. 90.

THE usefulness of the Carrel method of treating infected wounds is generally admitted. Some, however, who have tried this method of continuous irrigation of wounds have not had good results—and the Carrel method has been blamed. In many cases the method devised by Professor Carrel is not accurately carried out, and when this is not done it is unfair to discredit the method.

This translation by Lambert gives a clear and full account of the technique; it is well illustrated, and all details of dressings, &c., are fully explained. It should be in the hands of all surgeons and nurses who use Carrel treatment of wounds.

The little book is well translated, and admirably fulfils the object it was written for—*i.e.*, to explain the method without giving needless details.

L. G. G.

The Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods. By Reginald Hayes, M.R.C.S., &c. Third Edition, revised. London: Baillière, Tindall & Cox, Ltd. 1919. Cr. 8vo. Pp. viii +92. Plates IV.

This brief study of the Aix-la-Chapelle methods varies but little from the former editions. The author recommends the intensive treatment of syphilis by inunction of mercury, supplemented by injections of salvarsan or neo-salvarsan. He defines the Aachen method as the inunction of 33⅓ per cent. mercurial ointment by the bare hands of a skilled rubber, under proper medical supervision, and, in addition, the use of sulphur water internally and externally. He points out that haphazard methods leading to uncertain results are responsible for the fact that in this country inunction of mercury does not hold the position to which it is justly entitled.

In the present edition the illustrative cases have been brought up to date, which greatly enhances the value and interest of the book.

Lice and their Menace to Man. By Lieut. L. L. Lloyd, R.A.M.C. (T.); with a Chapter on Trench Fever, by Major W. Byam, R.A.M.C. London: Henry Frowde and Hodder & Stoughton. 1919. Pp. xii+136.

To most persons the ill reputation of the louse rests on the well-known ground that it is a disgusting, irritating creature, a symbol of filth, and not on the fact that its presence is a very real danger to the community. Yet typhus fever is entirely spread by its activities, as is relapsing fever over the greater part of the world, including Europe and Asia. Lately, trench fever has been added to its credit, and its power of spreading this disease is strikingly shown by the case of an officer who acted as

host to a single louse, scratched himself, and developed trench fever.

In the Army, disinfection of clothing by heat is found efficacious, as is steeping them in a hot 2 per cent. lysol solution. " N. C. I. Powder " (crushed naphthaline, with 2 per cent. each of creosote and iodoform) dusted inside the wearer's clothing is palliative, its killing and detergent action lasting for several days.

" YADIL " ANTISEPTIC.

MESSRS. CLEMENT & JOHNSON, 19 Sicilian Avenue, London, W.C. 1, have submitted samples of a comparatively new antiseptic, the registered name of which is " Yadil," but which is a chemical compound obtained by the distillation of methenal and allied groups, and so is termed trimethenal allylic carbide compound. It has already been tried both internally and externally in many forms of microbic infection, and apparently with success; more especially, quite recently in influenza. There are four preparations of this antiseptic—a liquid, a five per cent. jelly, a five per cent. ointment, and a ten per cent. pastille. The liquid and the jelly may be taken internally—the former in doses, for an adult, of from 30 to 60 drops in a cup of milk, tea, or water, three or four times a day. For infants under 12 months, ten to twenty drops may be added to milk in a feeding bottle. If the garlic odour of " Yadil " is objected to, it may be masked by a combination of peppermint water and chloroform water as a vehicle. It is claimed for " Yadil " that it is non-toxic, non-caustic, non-irritant, and that it does not stain.

The jelly is prepared from pure gelatine and sugar, agreeably flavoured with lemon, and is designed for use in septic throats, diphtheria, and similar conditions.

The ointment is prepared with a basis of adeps lanæ and paraffinum molle. It is useful in many forms of skin disease, furunculosis, abscesses, and such like morbid conditions. Its action is enhanced by the simultaneous internal administration of the liquid " Yadil."

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, March 22, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, March 22, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 33.8 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, March 22, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population:—Nineteen Town Districts, 33.8 and 40.6; Dublin Registration Area, 37.1 and 52.0; Dublin City, 38.8 and 55.9; Belfast, 30.9 and 31.5; Cork, 31.3 and 52.0; Londonderry, 54.7 and 41.3; Limerick, 25.7 and 32.5; and Waterford, 19.0 and 24.7.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, March 22, 1919, were equal to an annual rate of 1.2 per 1,000. Among the 238 deaths from all causes in Belfast were 2 from diphtheria, 1 from whooping-cough, and 1 from diarrhœa and enteritis in a child under 2 years. Included in the 46 deaths from all causes for Cork is 1 from typhus. Of the 43 deaths from all causes in Londonderry 8 were from whooping-cough, and 1 of the 8 deaths in Kilkenny was caused by that same disease.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended March 22, 1919, amounted to 171—90 boys and 81 girls, and the deaths to 307—134 males and 173 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 19) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 37.1 per 1,000 of the population. The rate for all deaths registered during the twelve weeks of 1919 ended March 22 was 38.0, while in the corresponding period of the preceding ten years, 1909-1918, it had been 25.8.

The 288 deaths appertaining to the Area included 6 from measles, 1 from diphtheria, and 5 from diarrhœa and enteritis of children under 2 years. There were 77 deaths from influenza, being equivalent to an annual rate of 9.9 per 1,000 of the population. Of these 63 belonged to the City, affording a rate of 10.6 per 1,000 of the population, including 38 (or 12.2 per 1,000) assigned to North City Districts and 25 (or 8.8 per 1,000) to South City Districts. Fourteen deaths from influenza (or 7.7 per 1,000 of the population) were referred to the Urban Districts. In the three preceding weeks deaths from this cause in the Registration Area numbered 153, 148 and 104, respectively.

Deaths attributed to pneumonia were 45 (comprising 20 from broncho-pneumonia, 7 from lobar pneumonia, and 18 from pneumonia, type not distinguished), as against 83, 89, and 60 in the three weeks preceding.

Tuberculosis caused 27 deaths as against 32, 37, and 36, respectively, in the three weeks preceding. Of the 27 deaths ascribed to tuberculosis, 23 were referred to pulmonary tuberculosis, and 4 to other forms of tuberculosis.

Seven deaths were caused by cancer, 13 by organic diseases of the heart, and 50 by bronchitis.

Among the deaths of infants under one year old, 7 were ascribed to influenza, 2 to convulsions, 6 to bronchitis, 9 to pneumonia, 5 to diarrhœa and enteritis, 4 to premature birth, and 1 to congenital debility.

Sixty-four of the deaths registered during the week appertaining to the Area were of children under 5 years of age, 36 being of infants under one year, of whom 7 were under one month old. Also sixty-four (64) deaths of persons aged 65 and upwards were registered, including 42 deaths of persons of 70 years or upwards.

Of the 288 recorded deaths 98 occurred in hospitals and other public institutions.

There were 5 violent deaths, 3 having been caused by burns, one of the victims being a child 3 years of age.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended March 22, 1919, and the cases under treatment at its close respectively, were as follow:—Enteric fever, 0 and 6; measles, 7 and 17; scarlet fever, 7 and 45 (exclusive of 15 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 5 and 9. Forty-seven cases of pneumonia were admitted during the week, and 111 remained under treatment at its close. Of the deaths in hospital recorded during the week, 1 was from measles, 1 from diphtheria, and 12 from pneumonia.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, March 22, 1919, in 96 large English towns (including London, in which the rate was 18.0) was equal to an average annual death-rate of 20.9 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 22.9 per 1,000, the rate for Glasgow being 25.5, and that for Edinburgh 18.3.

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of March, 1919.

Mean Height of Barometer, - - -	29.837 inches.
Maximal Height of Barometer (17th, at 9 a.m.),	30.750 ,,
Minimal Height of Barometer (2nd, at 9 a.m),	29.382 ,,
Mean Dry-bulb Temperature, - -	39.2°.
Mean Wet-bulb Temperature, - -	37.0°.
Mean Dew-point Temperature, - -	34.0°.
Mean Elastic Force (Tension) of Aqueous Vapour,	.197 inch.
Mean Humidity, - - - -	81.6 per cent.
Highest Temperature in Shade (on 10th), -	56.2°.
Lowest Temperature in Shade (on 30th), -	27.4°.

Lowest Temperature on Grass (Radiation) (3rd and 29th)	24.0°.
Mean Amount of Cloud,	58.7 per cent.
Rainfall (on 21 days),	2.186 inches.
Greatest Daily Rainfall (on 18th),	0.375 inch.
General Directions of Wind,	W., S.W., N.E.

Remarks.

A very cold month of unsettled weather and frequent precipitation, except in the period from the 12th to the 17th inclusive, which was fine and dry. On the latter date the barometer rose to 30.75 inches—the highest reading recorded in Dublin since February 25th, 1918 [30.784 inches]. The arithmetical mean temperature was 40.4°, or 3.3° below the average of the 35 years, 1881-1915. Snow fell daily on and after the 21st, and hail also was very prevalent. The month closely resembled March, 1916, which was very cold, snow and sleet falling on 11 days and hail on as many as 16 days.

During the week ended the 9th the atmosphere was very disturbed, numerous depressions passing over the west and north-west of Europe, secondary to a deep oblong system of low atmospheric pressure, which caused a violent gale on the 2nd. On the 10th a brief south-westerly gale sent the thermometer up temporarily to 56.2°, the highest reading of the month.

The third week (16th-22nd) opened with an anticyclone of much intensity, but of feeble staying power, centred over the British Isles. The barometer rose to 30.75 inches (1041.3 millibars) in Dublin on the morning of the 17th, but soon gave way rapidly during the night of the 18th, so that at 9 a.m. of the 19th the reading was as low as 29.47 inches. On this day the wind veered to N.W. and later to N.E., with a brisk fall of temperature, thus ushering in one of the longest and most severe spells of cold experienced during the present season. The mean temperature of the fourth week of March was 37.7°, or some 7.5° below the average for the time of year.

In Dublin the arithmetical mean temperature (40.4°) was 3.3° below the average (43.7°). The mean dry-bulb readings at 9 a.m. and 9 p.m. were 39.2°. In the fifty years ending with 1915, March was coldest in 1888 and 1892 (M.T. = 38.9°),

and in 1867 and 1883 (M.T. = 39.0°); warmest in 1903 (M.T. = 48.1°). In 1916 the M.T. was 39.8°.

The mean height of the barometer was 29.837 inches, or 0.079 inch below the corrected average value for March—namely, 29.916 inches. The mercury rose to 30.750 inches at 9 a.m. of the 17th, and fell to 29.382 inches at 9 a.m. of the 2nd. The observed range of atmospheric pressure was, therefore, 1.368 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 39.2°. Using the formula, *Mean Temp.* = *Min.* + (*Max.*—*Min.*) × .485, the M.T. becomes 40.2°. The arithmetical mean of the maximal and minimal readings was 40.4°, compared with a thirty-five years' (1881-1915) average of 43.7° The mean maximum was 45.8°; the mean minimum, 35.0°. On the 10th the thermometer in the screen rose to 56.2°—wind, S.W.; on the 30th it fell to 27.4°—wind, N.W. The minimum on the grass was 24.0° on the 3rd and also on the 29th.

The rainfall was 2.186 inches, distributed over 21 days. The average rainfall for March in the thirty-five years, 1881-1915, inclusive was 1.914 inches, and the average number of rain-days was 17. The rainfall, therefore, and the rain-days also were above the average. In 1867 the rainfall in March was very large—4.972 inches on 22 days. On the other hand, the smallest March rainfall was 0.288 inch on 8 days in 1893. In 1918, the rainfall was 1.032 inches on 13 days.

High winds were noted on 7 days, and reached the force of a fresh gale on the 2nd, 10th, and 27th. A solar halo appeared on the 6th and 17th, and a lunar halo on the 14th. There was a lunar corona on the 10th. Hail fell on as many as 8 days; snow or sleet on as many as 13 days. Snow or sleet fell daily on and after the 21st. During the latter part of the month the Dublin Mountains were deeply covered with snow. The lowest daily maximal temperature was 39.1° on the 4th. The highest daily minimum was 44.2° on the 7th.

The rainfall in Dublin during the three months ending the 31st of March amounted to 6.229 inches on 61 days, compared with 3.292 inches on 44 days in 1911, 8.799 inches on 61 days in 1912, 8.333 inches on 55 days in 1913, 5.585 inches on 57 days in 1914, 6.171 inches on 51 days in 1915, 8.361 inches on 66 days in 1916, 5.986 inches

on 53 days in 1917, 4.532 inches on 49 days in 1918, and a thirty-five years' average (1881-1915 inclusive) of 6.120 inches on 51 days.

Mr. A. W. Boyce reports that at the Normal Climatological Station at Trinity College, Dublin, the mean height of the barometer was 29.844 inches, the range of atmospheric pressure being from 29.386 inches at 9 a.m. of the 2nd to 30.737 inches at 9 a.m. of the 17th. The mean value of the readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 40.8°. The arithmetical mean of the daily maximal and minimal temperatures was 40.8°. The screened thermometers rose to 55° on the 2nd and 10th, and fell to 27° on the 30th. On the 13th the grass minimum was 15°. Rain fell on 19 days to the amount of 2.15 inches, the greatest fall in 24 hours being 0.38 inch on the 18th. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 89.2 hours, of which 8.2 hours occurred on the 29th, and 7.7 hours on the 15th. The mean daily sunshine was 2.9 hours. The mean temperature of the soil at 9 a.m. at a depth of one foot was 41.4°; at a depth of 4 feet it was 43.5°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J. Pilkington, Stirling, Clonee, Co. Meath; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin; Mr. F. Dudley Joynt, Donnybrook, Dublin; Mr. Harold Fayle, Sandford Lodge, Ranelagh, Dublin; Dr. Arthur S. Goff, Dundrum Castle, Co. Dublin; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow; Mrs. Sydney O'Sullivan, Auburn, Greystones; Dr. F. O'B. Kennedy, Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 2.18 inches, on 22 days. Average, 2.23 inches on 17 days. Maximum in 24 hours, 0.66 inch on 18th. In March, 1903, 3.86 inches fell; in March, 1893, only

0.66 inch of rain was recorded. Maximal temperature in shade, 53.9° on 10th; minimum, 25.1° on 30th. Since January 1, 6.72 inches of rain have fallen on 64 days.

Malahide.—[No return].

Clonee.—Rainfall, 2.96 inches, on 23 days. Maximum, 0.60 inch on 16th. Rainfall since January 1st, 9.03 inches, on 66 days.

Phœnix Park.—Rainfall, 2.51 inches, on 22 days. Maximum, 0.48 inch on 18th. Total amount of sunshine was 97.5 hours, the most being 7.4 hours on 29th.

Cheeverstown.—Rainfall, 1.82 inches on 21 days. Maximum, 0.30 inches on 2nd.

Donnybrook.—Rainfall, 2.105 inches, on 19 days. Maximum, 0.320 inch on 18th.

Ranelagh.—

Mean corrected Height of Barometer,	29.842 inches.
Highest corrected Reading, (17th, 9 hours),	30.75 ,,
Lowest corrected Reading (10th, 9 hours)	29.41 ,,
Mean Dry-bulb Temperature,	39.5°
Mean Wet-bulb Temperature,	37.6°
Mean Vapour Pressure,	0.206 inch.
Mean Humidity,	86 per cent.
Mean Maximal Temperature,	46.2°
Mean Minimal Temperature,	34.0°
Arithmetical Mean Temperature,	40.1°
Highest Temperature in Screen (10th),	57°
Lowest Temperature in Screen (13th),	25°
Lowest Temperature on Grass (13th),	15°
Nights of Ground Frost,	22
Rainfall (21 days),	2.17 inches
Greatest Daily Rainfall (18th),	0.35 inch
Mean Amount of Cloud,	65.2 per cent.
Days of Clear Sky,	3
Days of Overcast Sky,	14
General Directions of Wind,	E.N.E., W.

Remarks.—A cold, unfavourable month. The mean temperature of 40.1° compares with 44.5° last year. Maximal temperature did not reach 40° on four days, and snow and hail were frequent towards the close of the month.

Dundrum.—Rainfall, 2.25 inches, on 22 days. Maximum,

0.32 inch on 20th. Mean shade temperature, 42.8°; maximum, 62° on 10th; minimum, 26° on 29th.

Killiney.—Rainfall, 1.51 inches on 15 days. Maximum, 0.28 inch on 4th. Average at Cloneevin, Killiney (24 years, 1885-1908), 2.310 inches on 16.7 days.

Greystones (Rathdown House).—Rainfall, 2.45 inches on 23 days. Maximum, 0.30 inch on 11th.

Greystones (Auburn).—Rainfall, 1.91 inches on 21 days. Maximum, 0.28 inch on 2nd.

Newcastle.—Rainfall, 1.84 inches on 17 days. Maximum, 0.30 inch on 11th. Mean temperature, 39.8°; maximum, 54° on 10th; minimum, 25° on 29th; mean maximum, 45.8°; mean minimum, 33.8°.

Ennistymon.—Rainfall, 3.11 inches on 19 days. Maximum, 0.41 inch on 12th.

Castleconnell.—Rainfall, 3.10 inches on 14 days. Maximum, 0.43 inch on 28th.

Dunmanway.—Rainfall, 4.65 inches on 20 days. Maximum, 0.70 inch on 9th. Besides this, 0.67 inch fell on 2nd. The observer writes:—"March was a very cold month, especially from the 20th to the end. Slight snow-falls on nights of 3rd and 29th; snow on latter date was on the lowlands and not on the hills. There were constant frosts. No rain fell from the 22nd to the 26th, inclusive."

NEW PREPARATIONS AND SCIENTIFIC INVENTIONS

A NOTABLE EXHIBIT.

The keynote of Messrs. Burroughs, Wellcome & Co.'s display at the meeting of the British Medical Association, London, 1919, was "Replacement of Enemy Monopolies by All-British Products." From the fact that nearly twenty years ago Messrs. Burroughs, Wellcome & Co. were manufacturing pilocarpine and its salts, and at a little later date atropine, eserine, homatropine and their salts, it is obvious that this Firm did not wait for the stimulus of hostilities to commence their attack on German monopoly, and their pre-war production of the arylarsonate "Soamin" made easier their notable achievement in the production of "Kharsivan" and "Neokharsivan" which replaced German salvarsan and neosalvarsan at so early a date after the outbreak of war as to

mitigate in a large degree the inconvenience caused by the cessation of supplies of these products.

Aspirin, salicylic acid, sodium salicylate, hexamine (replacing urotropine), phenacetin, acetanilide, sodium glycerophosphate, benzamine salts (replacing B-eucaine salts), halazone, "Tolamine" (Chloramine T.), adrenalin, emetine, emetine bismuthous iodide, emetine hydrochloride, "Epinine," "Nizin," and "Ernutin" (synthetic ergot), were amongst other products exhibited.

A variety of vaccines and serums were exhibited—products of the Wellcome Physiological Research Laboratories, a noteworthy feature amongst them being "Influenza Vaccine" and "Influenza Vaccine Mixed." The former is indicated in cases where the presence of the bacillus influenzæ has been demonstrated, and for the mixed vaccine it is claimed that some immunity is developed against organisms producing pulmonary complications.

The "Hypoloid" products—hermetically-sealed glass containers of sterilised solutions presenting adrenalin, digitalin, "Epicaine," "Infundin," Strophanthin, &c., &c., are most convenient for instant hypodermic medication.

A variety of "Soloid" Brand Analysis Cases was also displayed—compact and portable outfits with all necessary apparatus and reagents for the examination of water, sewage, urine, &c. Blood test and bacteriological cases were also shown. The "Tabloid" Brand medical equipments range in shape and size from pocket-cases to comprehensive outfits designed for the physician's carriage or motor.

Messrs. Burroughs, Wellcome & Co.'s exhibit was a demonstration that despite war-time restrictions on development they have succeeded in enhancing their reputation for originality, accuracy, and reliability.

LITERARY NOTE.

In view of the recent outbreak of cerebro-spinal fever, Messrs. A. & C. Black's announcement of a forthcoming book on the subject is timely. The authors of the work are C. Worster-Drought, M.A., M.B., and Alex. Mills Kennedy, M.D., who were both posted for duty at Woolwich, and became responsible for this disease among the troops in the Woolwich Military District.

THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

JUNE 2, 1919.

PART I.

ORIGINAL COMMUNICATIONS.

ART. XV.—*Recent Researches on Trench Fever.*[a] By ROBERT J. ROWLETTE, M.D., F.R.C.P.I.; Physician formerly to Jervis Street Hospital, and now to Mercer's Hospital, Dublin; late Lieutenant-Colonel, R.A.M.C.

THE present war, which has formed nations into armies, and subjected the young manhood of the world to hitherto abnormal conditions, was bound to give rise to new problems in Medicine. In the past, military medicine and surgery, while differing in many points from civil medicine and surgery, remained more or less unchanged for long periods of time. The nature of the wounds received and the diseases present, and the system of dealing with the sick and wounded, showed little change from the time of Blenheim to that of Waterloo and to that of the Crimea. In the sixty years that have since elapsed, the development of medical and surgical science and technique on the one hand, and the changes in the nature of armaments

[a] The Presidential Address delivered to the Section of Pathology, Royal Academy of Medicine in Ireland, on Friday, November 1, 1918.

and military methods on the other, have caused remarkable changes in the nature of the problems which face the Medical Profession.

As in surgery the preponderance of bullet wounds, due to long-distance fighting in the South African War, has given place to a preponderance of shrapnel and high explosive injuries, due to trench warfare and the increased use of artillery, so also have the altered conditions of present-day warfare given rise to a different set of medical and epidemiological problems from those which were encountered in South Africa.

In the South African War the chief medical diseases of the war were enteric and dysentery. The latter still is a source of great disability and suffering in our tropical and sub-tropical campaigns, but it does not cause much loss of power on the Western Front, where the main forces of our army are engaged.

Enteric—including the paratyphoids as well as typhoid—is, on the whole, well in hand. Although by no means uncommon in the British Armies, even in France, it is now, in its modified form, a cause of only slight mortality, and it cannot stand high in the list of diseases which are responsible for loss of efficiency. Few nowadays are in a position to compare small-pox as it occurs in unprotected persons with the same disease in those recently vaccinated. The difference of type is, however, probably no greater than the difference between enteric, as we were accustomed to it in my student days in Dublin, and the enteric one now meets in the protected persons in the British Armies. It is true that the main features of the diseases are the same—the prolonged fever, the type of temperature chart, the characteristic tongue, the tendency to abdominal distension—but in the inoculated, these features are a mere miniature of those seen in the unprotected. Judged from the clinical side only, at first sight one would hesitate to regard the two conditions of the same disease, but a little study shows that the features are the same—though, as I suggested, reproduced in miniature.

The war, however, has not merely shown us old diseases

altered by modern conditions, but it has given us at least one disease not previously known to medical observers.

This disease—known in the early days of its observation by such names as trench fever, skin fever, shank fever, quintan fever, but now known among English-speaking folk as "trench fever"—presents us with a very interesting pathological problem. It differs from most other problems which pathologists have had to face in that pathological research began simultaneously with clinical observation. Previous problems were concerned with diseases known to generations of practising physicians. The pathologist arrived late, so to speak, and he found a trail already blazed, not always in the right direction. He was helped, or sometimes hampered, by the results of continued observation from the purely clinical standpoint. In the present case, however, he could start fresh, and I have chosen the subject for this address in the hope that it might be of some interest to watch his progress, to look on at science in the making.

"Trench fever" is not only of interest from the point of view of scientific curiosity, but it presents a practical problem of great importance. It is true that it is a disease which does not cause death, but taken in the mass, it causes an immense disability and, consequently, an immense loss of man-power. Figures as to sickness of the armies in the field are, of course, not available for public use, and we can make only comparative estimates from personal observations. McNee (1) estimates, for example, that infections of the skin (of which scabies is the chief cause) and pyrexias of unknown origin (most of which are trench fever) between them were responsible for 90 per cent. of all the sickness in the British Armies in France. Grieveson (2) found at one time that trench fever formed 40 per cent. of his hospital evacuations and 60 per cent. of all cases of sickness. In my own experience during the winter and spring months of last season, trench fever formed the great majority of the medical cases under care in a Base Hospital in France, and formed an absolute majority of the cases admitted to hospital in the weeks

prior to the German offensive which began in March, 1918.

Moreover, trench fever causes a disability which lasts for some time. In only rare cases is a patient fit for any duty inside a month of the onset, and it is probable that the average disability per case is between six and eight weeks.

This takes no account of the recurrent pains and persistent myalgias, which in many cases give rise to much loss of time for many months after an attack.

As the disease in its most typical form is only rarely seen at home, I may be permitted to give a brief sketch of its clinical features.

The onset is sudden or rapid, with severe headache, frontal and retro-ocular, pains in the back, and a temperature which may be anywhere between 100° and 104°. It presents, in fact, certain features in common with the onset of the influenza, now epidemic in Dublin, but here the resemblance ends. Another frequent incident is sharp pain in the left side, probably splenic in origin, but closely simulating the pain of pleuritis. Some abdominal pain is not uncommon.

After a day or two the headache diminishes or disappears, but the pain appears in the shins, and may sometimes be very severe, with great tenderness along the subcutaneous surface of the tibiæ. There is never any marked nasal or bronchial catarrh, but a few crepitations at the base of one lung, nearly always the right, are commonly to be heard. The spleen is usually enlarged, and is nearly always tender.

After two or three days the temperature subsides by rapid steps, all the other symptoms disappearing at the same time, except the pains in the shins. After an interval of from four to eight days—most usually five days—the temperature again rises to the same height as before, or perhaps a little less. The other symptoms ensue, and the whole series of events is repeated, but usually with less severity than in the first attack. After the same interval as before there is usually another recurrence. Three to five such recurrences are fairly common, each

somewhat less severe than its predecessor. Even after health has been apparently restored relapses may occur after long intervals. During the course of the disease the record of the pulse-rate shows a parallelism to that of the temperature. The shin pains and various myalgias may persist for many weeks or even months.

I have described the most typical form of trench fever in its main features in order to give those who are not familiar with it some picture of the clinical condition. I have avoided details of the less constant features, and it must be borne in mind that various less typical forms occur, and it is quite possible that some of them will eventually be found to be distinguishable conditions.

It will be seen from the picture I have drawn that the disease does not, in fact, resemble very closely any previously known disease. Nevertheless, it was inevitable that when, in the summer and autumn of 1915, cases were first noticed, medical officers should have made mistaken diagnoses. A diagnosis of influenza was frequently made, and "rheumatic fever" was also a frequent diagnosis. The more cautious adopted the term "pyrexia of uncertain origin," or briefly, "P. U. O.," a term which has unfortunately been assumed by many to be synonymous with "trench fever," whereas it in reality is almost synonmous with another familiar entry—"N. Y. D."—not yet diagnosticated.

In spite of its dissimilarity to the ordinary types of previously known diseases, it was necessary to establish by careful investigation that it was not in reality some variant type of a perhaps familiar infection. True, it was urged by some that trench fever was an atypical typhoid or paratyphoid; by others that it was a form of syphilitic infection. Fanciful as these ideas appear, it was necessary to investigate whether there were any real grounds for them. The matter was finally settled as regards these points by the American Commission, with whose work I will presently deal.

At the same time it is worth noting that trench fever has certain resemblances to certain fevers of the tropics—

notably the "seven days' fever" of India, and the "Colombo fever" of Ceylon, of which cases have occurred recently in Serbia, but there are points of difference as to both. There are, however, other imperfectly described fevers of the tropics, and it is not impossible that one of these, accidentally introduced to France, found conditions favourable for its spread, and, as often happens when a strange infection touches a fresh community, extended far more widely than in its accustomed habitat.

It was early in the summer of 1915 that cases of trench fever were first noted in France, and since that time it has occurred in Salonica, in Mesopotamia, in England, in Italy, and in the German and Austrian armies. Its incidence has apparently always been greatest among British troops.

The first serious contribution to the study of the disease came in a paper published in February, 1916, by McNee, Renshaw and Brunt (3). They noted its occurrence in two classes of subjects—men from the trench zone and men of the Royal Army Medical Corps. They observed in particular the occurrence of the disease in orderlies in immediate attendance on men suffering from trench fever. Having given a careful clinical description of the disease, they next detailed certain important laboratory investigations. They attempted to convey the disease from man to animals by injecting whole blood and serum respectively, but the experiments gave negative results. On the other hand, the disease was easily conveyed from man to man by transfusion, or by intramuscular injection of blood. They failed to infect when they used serum instead of whole blood. They concluded that the virus resided in the corpuscles, and after repeated washing in saline the corpuscles were still infective. All microscopic examination of the blood was negative; the blood-counts did not yield very important results; and the only constant blood-change was a punctate basophilia.

As regards the means of transmission, these investigators were at the time unable to furnish any definite evidence. They remark, however: "The fact that only two classes

of men are affected—those from the trench zone and men of the Royal Army Medical Corps—is, however, suggestive. The disease is either contagious from man to man, or, what seems much more likely, is carried by one of the common flies or parasites found in the trenches. During the past summer, lice, mosquitoes, midges, and flies of other kinds have all been common in the Flanders war zone."

These experiments of McNee and his colleagues were made under the greatest difficulties, and without any special facilities being afforded them, nor does it appear that their importance was ever recognised by the medical authorities of our armies in France.

Further notes on the disease appeared from time to time, and the general consensus of opinion appeared to tend towards incriminating the louse as the agent of transmission. It is curious that in the early days there does not appear to have been the same seasonal incidence in winter as has been noted later. If there had been, blame would hardly have been cast on flies or mosquitoes.

Early in 1917 Davies and Weldon (the latter a licentiate of the College in whose hall we meet) (4) reported a successful experiment on the person of Weldon of the transmission of trench fever by lice. The experiment is described thus :—

"Some score of lice were collected and starved in captivity for three days; a number of them died. Two pairs of the survivors were taken and allowed to bite, under a watch-glass, two patients suffering from 'trench fever' in an acute stage. After allowing them to feed for about 15 minutes their meal was interrupted, and each of us then allowed a pair to feed upon himself, strictly confining their sphere of operation by means of a securely fixed water-glass. The one of us whose duties did not bring him into the wards subsequently, 24 hours' later, allowed his pair to have a further meal upon himself. Twelve days later very startling developments took place. The characteristic symptoms manifested themselves, and he passed through a most typical attack of the condition

of average severity, with the pains and other features all present. It may be further noted that the victim had not at any time been nearer to the front than the base, nor had he been subject to any previous similar condition."

Except for this solitary but luminiferous experiment, no advance seems to have been made in the knowledge of the pathology of trench fever from the time of the work of McNee and his colleagues, published early in 1916, until the American Red Cross Commission got to work early in this year. No sooner, however, had the American Commission got to work in the early months of last winter than the British authorities in the same month appointed an independent commission to investigate the same problem.

The American Commission, of whom Major R. P. Strong, M.R.C., was chief, started work on February 4, 1918, at a British Stationary Hospital commanded by Colonel B. Burke, L.R.C.S.I., and its work was interrupted on March 27 by the German offensive. The positive results obtained in this short time are a remarkable tribute to the energy and organising ability of the "team" who constituted the Commission. That scientific zeal was not confined to the members of the Commission is shown by the fact that when they were given leave to ask for volunteers from hospital orderlies in the American Army, "practically all the men of the 101st, 102nd, and 104th F.H.'s, and 101st, 102nd, 103rd, and 104th Ambulance Companies volunteered for this service" (5). The necessary number of specially picked men was selected, only those of robust health being accepted, while complete bacteriological and serological examinations were made in every case.

One of the first tasks undertaken by the Commission was to differentiate trench fever quite definitely from typhoid and paratyphoid. The urine and faeces of all volunteers subjected to experiment and of all patients suffering from trench fever who were employed for investigation were repeatedly examined for typhoid and paratyphoid fever, with negative results. The blood of volunteers subsequent to infection was also examined—

with negative results. These results bore out what might have been expected, and have set at rest a theory which, having nothing in its favour, yet required disproof.

Before proceeding further, it was necessary to confirm or reject McNee's statement, that the blood of trench fever is infective, and to inquire what element of the blood, if any, carried the infection. With whole blood, or citrated whole blood, almost every experiment succeeded. With whole plasma, trench fever was transmitted five times in five experiments. With washed corpuscles, it was transmitted three out of four times. Of eight filtration experiments, five with thoroughly centrifuged filtered plasma, one with centrifuged filtered serum, and two with filtrates of ground corpuscles, all but one were entirely negative. The incubation period varied from five to seven days when blood was taken on the first to the third days of the disease. In three cases in which it was taken, during the first relapse, the incubation period was prolonged to 13 days in two cases and to 20 in one. With citrated blood kept out of the body for several hours, the average incubation period was 11 days. Whole plasma gave an average period of six days. It will be noted that the only point in which the American observers differ from McNee is their positive result with plasma, and their consequent conclusion that the virus is not resident in the corpuscles, but, at the most, intimately mixed with them.

The main interest of the American work centres round their study of the louse as a possible agent of transmission.

Most of the lice employed were laboratory-bred animals from the Lister Institute, in London, but in a few experiments wild lice caught in their native habitat were employed. Two methods of feeding were devised. In the *box* method, a number of lice immured in a pill-box were allowed to feed on the skin by the expedient of inverting the uncovered box and fixing it in position by a bandage. In the *cell* method the lice were allowed free movement within the ambit of a calico cell fixed to the skin by adhesive tapes. With this device, the subject could, if he so wished, relieve his itching by pressing the cell to the

surface of his body, possibly crushing the offending lice and their fæces into his skin.

It is, of course, impossible in the limits of this paper to follow in detail the experiments bearing on the transmission of trench fever by lice. I can only state briefly a few of the most important findings.

A high proportion (70 per cent.) of subjects exposed to laboratory-bred lice previously fed on trench fever patients developed trench fever; in some cases an interval of two days having elapsed between the feeding on the patient and that on the subject of experiment. Of three men exposed to wild lice picked from the clothing of trench fever patients, two developed the disease. Lice fed on trench fever patients immediately before and within the two or three days succeeding the onset failed to transmit the disease. Lice fed on a man who had had trench fever nine months previously failed to transmit the disease. No evidence was obtained of the louse transmitting infection to its offspring through the egg.

Having established a strong case against the louse as the agent of transmission, the Commission next investigated the question of the manner by which infection is conveyed by the louse.

The main experiment was very simple. The fæces of presumably infected lice were collected at a time when the lice were feeding on healthy subjects. The dried fæces, beaten into a paste with sterile saline solution, were rubbed with excoriations made with a sterile scalpel. This experiment was performed in four cases, and all four men developed the disease—one in 7 days, one in 9, and two in 10. Whether infection is conveyed by other methods or not there is at present no conclusive evidence, but infection occurred by simple biting when no scratching and no visible scarification of the skin were present.

It was not possible to determine accurately the incubation period in the cases of louse-borne infection, since it could not be known at what date the louse itself became actively infective. The earliest day at which trench fever

appeared after the access of presumably infected lice was the 14th, and the latest the 38th. On the other hand, it was shown that a man might develop trench fever as late as from 10-23 days after infected lice had last fed upon him.

Important experiments were performed to establish whether accidental transmission could take place by the excreta of trench fever cases. Sputum, urine, and fæces of trench fever cases were rubbed into scarified areas of skin. In one case out of five the mixed sputum and saline produced the disease. The fæces were non-infective, but the urine was infective. No accidental contagion occurred in lice-free subjects. The practical importance of these experiments is obvious.

Of practical importance, too, is the observation that the virus (in urine and louse fæces) resisted 60° C. moist heat for 30 minutes, but was killed by 70° C. for the same period. A temperature of 55° C., which is sufficient to kill the lice and their ova, does not destroy the virus.

Let me finally read the most important facts established, as summarised by Major Strong (6) :—

"1. That trench fever is a specific infectious disease ; that it is not a modified form of typhoid or paratyphoid fever, and is not related, from an etiological standpoint, to these diseases.

"2. That the organism causing the disease is a resistant filtrable virus.

"3. That the virus causing trench fever is present, particularly in the plasma of the blood of trench fever cases ; and that such plasma will produce the disease on inoculation into healthy individuals.

"4. That the disease is transmitted naturally by the louse, *Pediculus humanus*, Linn., *var. corporis ;* and that this is the important and common means of transmission ; that the louse may transmit the disease by its bite alone, the usual manner of infection, or the disease may be produced artificially by scarifying the skin and rubbing in a small amount of the infected louse excrement.

"5. That a man may be entirely free from lice at the time he develops trench fever, the louse that infected him having left him some time previously as its host; and that the louse need only remain upon the individual for a short period of time in order to infect him.

"6. That the virus of trench fever is also sometimes present in the urine of trench fever cases, and occasionally in the sputum; and that the disease may be produced in man by the introduction of the virus in the urine or sputum through the scarified or otherwise abraded skin.

"7. That since the urine, and sometimes the sputum, of trench fever patients are infective, these should be sterilised in order to avoid the possibility of accidental infection from them.

"8. That, in order to prevent trench fever or limit its spread, and thus save man-power for the armies, greater efforts must be made to keep soldiers in general from infestation with lice."

It will be seen that, far-reaching as are the results of these investigations as to the mode of transmission of trench fever and their practical application, we are yet in the dark as to the nature of the virus itself. It is constantly present in the plasma, and commonly in the urine and saliva; it is filterable; it resists moist heat to between 60° and 70° C.; it has not been seen in any microscopic preparation. What is it?

There is still work for investigation.

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(2) Lancet. 1917. Vol. II. P. 84.

(3) *Ibid.* 1916. Vol. I. P. 225.

(4) *Ibid.* 1917. Vol. I. P. 183.

(5) "Trench Fever: Report of Commission, Medical Research Committee, American Red Cross." Oxford University Press. 1918. P. 6.

(6) *Ibid.* P. 9.

ART. XVI.—*Accidental Hæmorrhage.*[a] By SIR WILLIAM SMYLY, M.D., Dubl.; F.R.C.P.I.

THE subject which I intend to discuss in this communication is accidental hæmorrhage, and especially its connection with puerperal eclampsia.

In my opinion Schmorl was right when he stated that puerperal eclampsia is a disease peculiar to pregnant women, and characterised by certain pathological anatomical conditions first described by him in 1893. Those conditions, which were chiefly characterised by thrombosis of blood-vessels, necrosis of the cellular elements of the tissues, and hæmorrhages, were found by him in all the autopsies which he made upon nearly 100 women who had died of eclampsia, and were considered by him to be essential to and characteristic of the disease. Therefore, when they were present, the case was one of eclampsia; when they were absent, it was not. In a subsequent paper he described the *post-mortem* examination of some cases which had died in coma without any convulsions, in which the same pathological conditions were found; therefore, they were cases of eclampsia, though without convulsions.

It has for long been known that, as a rule, convulsions are preceded by a complex of symptoms which we have been accustomed to call the pre-eclamptic state. Most of these so-called pre-eclamptic cases, however, do not develop convulsions: but whether they do so or not, the disease is evidently the same. I have already stated that one of the essential characteristics of this disease is hæmorrhage —most commonly minute petechial hæmorrhages, but occasionally very extensive, serious, and even fatal, in amount. Anyone who has had much experience of eclampsia must have met with such cases where the bleed-

[a] Read before the Section of Obstetrics in the Royal Academy of Medicine in Ireland on Friday, November 22 1918.

ing occurred into the brain, into the eye—detaching the retina, into the peritoneal cavity, or under the skin; but it is only recently that our attention has been called to the fact that they occur into the uterus also. In a previous communication I detailed three such cases, and shall in this paper add two more.

Since then all these conditions are examples of one and the same disease, it is desirable that they should be grouped under one name. Eclampsia is not a suitable term, because it is applied to convulsions of all kinds, and is inapplicable to those cases in which there are none. Toxæmia is objectionable also, because there are toxæmias occurring in pregnancy which are not, as far as we know, examples of the condition we are now considering. In 1908 Dr. Bar published a paper, in the *Revue mensuele de Gynécologie, d' Obstetrique, et de Pædiatrique*, which, unfortunately, I have been unable to get hold of, in which he suggested that whilst retaining the term eclampsia for those cases in which there were convulsions, we might employ the word eclampsism for those in which there were none. It appears to me to be an excellent suggestion.

Since 1776, when Rigby taught us to distinguish accidental from unavoidable hæmorrhage, our knowledge of the nature and treatment of the former has developed very slowly. In course of time we learned that cases in which the effused blood is wholly or almost altogether retained are much more serious than those in which it escapes freely from the vagina, and further, that premature separation of the normally-seated placenta is often associated with albuminuria. In attempting to explain these facts it was assumed that the albuminuria resulted from a nephritis, which, by causing endometritis, resulted in a diseased decidua and a loosely-attached placenta. This I believe to be erroneous. The condition of the kidney is more necrotic than inflammatory, and in the cases examined by Whitridge Williams, there was no endometritis. Latterly, the association of accidental hæmorrhage with eclampsia has attracted attention, but in the present state of our know-

ledge it would be impossible to say in what proportion of the cases the combination occurs; though the impression left upon my mind, from personal experience, is that most if not all the cases of severe, and especially of concealed, internal, hæmorrhage are due to this disease.

The treatment of concealed hæmorrhage by abdominal section originated with Dr. William Bagot, now of Denver, Colorado, then Assistant to the Master of the Rotunda Hospital, and was successfully carried out by him upon a patient in the Extern Maternity. But it was several years before any other operator ventured to follow his example; and when, in 1910, Dr. Amand Routh published a report upon 1,280 cases of Cæsarean Section collected from Obstetricians living in Great Britain and Ireland, only three had been performed on account of accidental hæmorrhage. Since then, however, it has been resorted to more frequently, and is now, I believe, very generally recognised as advisable, at least in those cases in which the patient is not in labour and the hæmorrhage is concealed. Since the introduction of this line of treatment, which in my opinion marks a distinct epoch in obstetric history, we have learned that the actual conditions are very different from what we had imagined them to be. We knew, of course, that the placenta was detached from the placental site, and that the uterus was distended with blood, and we assumed, from the fact that this effused blood was not expelled, that there must have been a weakening or paralysis of its walls, but we had no idea, or a wrong one, as to its cause. Now we know that the blood is poured, not into the uterine cavity alone, but also into its muscular wall, which is suffused with blood, separating, and no doubt injuring, its muscle cells; and sufficiently accounting not only for the yielding of the walls to the pressure of the blood, but also for the extreme difficulty which has sometimes been experienced in controlling post-partum hæmorrhage. In many of the reported cases there was hæmorrhage also into the pelvic cellular tissue, especially between the folds of the broad ligaments, and into the

peritoneal cavity. In two cases reported by Whitridge Williams, in 1915, in which the uterus had to be removed, the microscopic examination showed that the hæmorrhages had spread apart the individual muscle fibres and bands, and in places was associated with considerable œdema—apparently it was not connected with the larger vessels. Section through the placental site showed similar changes in the muscular wall; but the deciduæ were normal, except for small hæmorrhagic areas. In this region many of the larger veins were almost completely filled with large thrombi, and many of the smaller veins were almost occluded with thrombi. The large arteries were normal, but many of the small ones presented changes in the intima suggesting a mucoid change, and it projected into the lumen, and in many places defects were observable in it. The principal pathological conditions present, therefore, were thrombosis of veins, necrosis of the intima of the small arteries, and hæmorrhages into and œdema of the uterine walls. This remarkable condition of the uterus has, during the last few years, been frequently noted by other observers in connection with accidental hæmorrhage, and at a meeting of the Obstetrical Section of the Royal Society of Medicine, in November, 1916, no fewer than eight cases were reported. One by Dr. McNair. The patient's five previous pregnancies terminated naturally at term. In the 34th week of her sixth pregnancy she was seized with violent abdominal pain and faintings, and some hours later was admitted to Guy's Hospital. The case was one of severe internal hæmorrhage without any external loss. The os was one-third dilated and the membranes intact. Labour was completed by manual dilatation of the cervix and craniotomy. She died four hours later. At the autopsy, 21 ozs. of blood was found free in the abdominal cavity. The anterior surface of the uterus showed numerous lacerations, some of which were mere fissures of the serous coat, whilst others penetrated more deeply into the uterine muscle. There were many subserous hæmorrhages, and on section the muscle showed patches of hæmorrhagic infiltration, which on microscopic

examination were seen separating apparently healthy muscular tissue. The urine contained a trace of albumen.

Another case was reported by Drs. Oldfield and Hann. The patient, aged 38, was in the 8th month of her first pregnancy. A few days before the sudden onset of her illness she had noticed some swelling of her feet and face. Suddenly she was seized with severe abdominal pain, followed in a few hours by symptoms of serious internal hæmorrhage, with some loss externally. Her face was œdematous, and she complained of severe headache and almost total blindness. An ounce and a half of urine, drawn off by catheter, was blood-stained, and loaded with albumen; no dilution of the os. *Hysterectomy.*—The uterine tissues were broken up and infiltrated with blood, as were also the broad ligaments, the hæmatomata extending on to the bladder in front and outwards, as far as the cæcum on the right and the meso-sigmoid on the left. The patient made a complete recovery, the toxæmic symptoms gradually subsiding, until on the 18th day her urine was free from albumen.

Dr. Fletcher Shaw, of Birmingham, reported six similar cases. The first of these patients delivered herself by natural efforts, but as post-partum hæmorrhage continued, and could be controlled in no other way, the uterus was removed some hours later. The other patients were all delivered by Cæsarean section, followed by supra-vaginal amputation of the uterus. In all the cases in which the urine was examined it contained a large amount of albumen. Five had large hæmatomata in the broad ligaments, and two free blood in the peritoneal cavity. In all of them there was blood extravasated into the uterine wall—more markedly in the superficial layers, and especially under the peritoneal layer. This latter condition has been described by Couvelaire as uteroplacental apoplexy, and although he considers it to be a constant feature in accidental hæmorrhage, yet he regarded it as merely the result of over-distension of the uterus. That is, in my opinion, a most important question: because if the effusion of blood into the muscular tissue were the result of over-distension

then its connection with eclampsia is not so obvious as I suppose it to be. But if, on the other hand, it can be proved that this condition is not caused by over-distension, that it occurs only in patients with symptoms of toxæmia, and that the anatomical conditions associated with it closely resemble those which cause hæmorrhages in other parts of the body in eclampsia, then it would seem to me a justifiable conclusion that it is due to the same cause. As regards the theory that the remarkable condition of the uterus is merely the result of its over-distension, I may refer to some experiments carried out by Dr. Arthur H. Morse in Yale University Medical School, and published in *Surgery, Gynæcology, and Obstetrics*, February, 1918. He was prompted to make those experiments by two cases of concealed accidental hæmorrhage, in which he was struck by the resemblance between the conditions there found and those which are met with in cases of ovarian tumours with twisted pedicles. His first endeavour was to discover whether sudden over-distension could, as had been affirmed, produce such phenomena. With that object he exposed, by abdominal section, the uterus of a pregnant bitch, inserted a canula into it, and injected saline solution until it was distended almost to bursting. No ill-effects, excepting abortion, followed; and when the abdomen was again opened, after 48 hours, the previously distended horn was found to be entirely normal, without any sign of injury. That experiment showed that even extreme and acute increase in intra-uterine pressure did not cause extravasation of blood into the myometrium. Some time after he made a further series of experiments upon rabbits, with a view to ascertain what the results of venous obstruction in a pregnant uterus would be. He discovered that, when all the veins returning blood from a pregnant horn had been ligated, it became deeply cyanosed and distended —at first functional, but ultimately firm, tense, and resistant to pressure. After from two to four hours it was found enlarged to about twice its former size, and was quiescent, muscular action having ceased. When incised the uterine cavity was found filled with blood, which sur-

rounded the unruptured fœtal sacs; the placentæ were partially or completely separated from their attachment, and minute extravasations of blood were visible in the myometrium. The microscope showed hæmorrhagic extravasations in the decidua and at various points in the uterine wall, as well as dissociation of the muscle fibres. In fact, in every particular an exact reproduction of the conditions found in cases of accidental hæmorrhage.

I shall now report two cases which came under my care in the Rotunda Hospital, and which, I believe, support the contention that eclampsism is a cause of accidental hæmorrhage.

Case I.—A. M., aged 30, 3-para. Admitted September 1st, 1917, at 8.40 a.m. Her previous pregnancies had terminated normally at full term. On this occasion she had noticed nothing unusual until the evening previous to admission, when she was seized with abdominal pain, and a feeling of distension, and she noticed an increase in the size of her abdomen. When admitted to the hospital she was in a collapsed condition, blanched and cold; temperature 95.4°; pulse hardly to be felt. Uterus very hard and tender on palpation; no fœtal parts could be felt; no visible hæmorrhage. Urine scanty; loaded with albumen; casts in large number, cellular, granular, and hyaline; some pus and red blood cells. Immediate operation was decided upon When the abdomen was opened the uterus presented a remarkable appearance: dark, almost blue, in colour, with blood extravasation in patches over its surface, the peritoneal covering being in places raised in large blebs filled with blood, one of which upon the posterior surface had burst, the rent being about an inch long, and there was free blood in the peritoneal cavity. When cut through, the uterine wall showed blood extravasation throughout. The cavity was filled with blood, and the placenta completely detached; the child was, of course, dead. After the uterus had been emptied, and the wound closed in the usual manner, it contracted well after a dose of pituitrin had been administered hypodermically. There was no further hæmorrhage, and she made a good recovery, the

urine being free from albumen before she left the hospital.

Case II.—M. J. McD.; aged 39; 9-para; 36 weeks' pregnant. Was sent to the Rotunda by Dr. Rice, of Portarlington, and admitted 7th December, 1917.

History.—Twelve years previously her first pregnancy terminated prematurely at the 8th month, in consequence of eclampsia, preceded by headaches and disordered vision, and ever since the sight in her left eye had been impaired. She had convulsions, and was unconscious for a week; the child was still-born. The four succeeding pregnancies were normal, and the children living. But after the birth of the last, four and a half years' previously, she did not make a satisfactory convalescence; had three abortions subsequently, and was curetted in 1916.

On admission she said that she had been ill for about three weeks, suffering from headaches and impaired vision. There was a large ecchymosis on the left buttock. The urine was scanty, and of a bright red colour, and contained a large quantity of blood and tube-casts. The child could be easily palpated, the head presenting in the first position. The diagnosis was pre-eclamptic toxæmia, and she was treated in the routine manner, introduced by Dr. Tweedy, getting nothing by the mouth but sodium bicarbonate and water. She got little sleep, in spite of a hypodermic injection of morphine, and the total quantity of urine passed in the first 24 hours was 20 ozs. The blood-pressure was 260 mm.

The following day there was no improvement, and some twitching in the muscles of her arms. She was given ¼ gr. morphine hypodermically. During the following days there was no marked change in her condition; but on the sixth day she seemed to be rather better, and had passed 31 ozs. of urine during the previous 24 hours, but in quality it was the same as upon admission, and the blood-pressure was still 250 mm.

Considering that she had been restricted to soda and water for five days, since her admission to hospital, and

that she said that she had eaten nothing for two days before that, I thought it advisable to give her some nourishment. Accordingly, at 12.30 p.m., she took four ounces of milk with an equal quantity of barley-water. At ten minutes past one she complained of a violent pain in her abdomen, and said that she could see nothing. She looked pale and collapsed. Her skin felt cold, clammy, and bathed in perspiration; her temperature below normal, and a little reddish discharge flowed from the vulva. Her abdomen was evidently larger, the uterus swollen, hard, and tender, and the fœtus no longer palpable. Her condition, indeed, appeared desperate, but being persuaded that her life could be saved in no other way, I determined to operate immediately. The abdomen having been opened, the uterus presented the same remarkable appearance which I have already described, being much distended, of a dark, bluish purple colour, with numerous patches of ecchymosis on its surface. The wall when cut through showed blood extravasated throughout its substance. The placenta was completely detached, the cavity full of blood and clots, and the fœtus dead. To save time, which was of vital importance, I closed the uterine incision with a running suture of Van Horns' catgut, otherwise the operation was carried out in the usual manner. Towards its close the patient appeared to be dead, but gradually revived, and was removed to bed. She made a good recovery, though, owing to her toxæmic condition, she was still restricted to soda and water for the three succeeding days. Her urine improved rapidly both in quantity and quality, so that on the fourth day it was normal in colour and free from albumen.

I believe that a consideration of these cases, together with the three which I brought to your notice in a previous communication, coupled with the facts to which I have again drawn your attention, is sufficient to prove that many if not most of the cases of severe accidental hæmorrhage are due to conditions not only closely allied to but identical with those which cause eclampsia. That is the main point

which I wish to emphasise, but there are some others which I might mention. As regards dietary in these cases, it is often asked how long can a patient be kept upon water alone? and it is in that connection interesting to note that in the second case, excepting one solitary feed of milk and barley-water, she had nothing else for certainly eight, and probably ten, days. Further, that that one meal was followed, within one hour, by a very serious aggravation of her condition. And, lastly, that in neither case did I find it necessary to remove the uterus.

ART. XVII.—*On Skin-Stains and Hair-Dyes.*[a] By WALTER G. SMITH, M.D.; ex-President, R.C.P.I.; Physician to Sir P. Dun's Hospital.

(*Continued from page* 205. *No.* 569.)

PART II.—HAIR DYES.

A FEW words first about the structure and composition of the shaft of the hair, the part which is concerned in hair-dyes.

The hair shaft is a complex structure, and is essentially composed of three parts: (*a*) a thin transparent cuticle, (*b*) a fibrous cortex, which constitutes the bulk of the hair, and (*c*) a central medulla, which is usually present in thick, short, and strong hairs, but is often absent in lanugo, and in coloured hair of the scalp. Some hair-dyes affect only the surface of the hair—*e.g.*, Henna—and, hence, are unsatisfactory. Others penetrate through the cortex, and give therefore better results. The contour of the hair varies greatly, and cross-sections show considerable diversity of form.

Chemically, all skin structures, with the exception of fat, belong, as already stated, to the group of proteins, and of certain derived forms of protein, termed scleroproteins—viz., collagen, elastin, and keratin—which constitute the skeletal frame-work of animals. That form of sclero-

[a] Part II. read before the Section of Medicine in the Royal Academy of Medicine in Ireland, on Friday, April 4, 1919.

protein of which hair is composed, is, as we have seen, known as keratin, and several varieties of keratin are recognised which can be distinguished by chemical means.

Hair yields a large proportion of cystin, a sulpho-amino-acid : as much as 15 per cent. The sulphur in cystin is answerable for the staining produced by metallic hair-dyes, owing to the fact that sulphides of most of the heavy metals—*e.g.*, lead, silver, and bismuth—are black.

There are many kinds of human hair as represented by the various races of man, and these variations are useful in ethnological classifications. But the character of hair with which we are now concerned is colour. This, also, varies greatly with the race and with the individual.

Except among certain races—viz., Teutons, Celts, and Finns—dark or black hair is the predominant colour.

Black hair is highly esteemed by the Orientals, and in the Eastern love poem, "*The Song of Solomon*" (v. 11), the amorous lady dotes upon her lover because "his locks are bushy, and black as a raven."

Abundance of hair, alluded to above, was regarded as a symbol of vigour and strength, and we recall the story of how Samson was shorn of his strength and beguiled of his seven locks of hair by his traitorous paramour.

Conversely, absence of hair was regarded as a reproach, and we are reminded of what happened to the saucy children who called out to Elisha, "Go up, thou baldhead."

People are not always content with the natural colour of their hair, for national customs, the vagaries of fashion, and the caprices of feminine vanity have for ages past led to the employment of various agents for altering the colour of the hair, or for defeating the ravages of time.

I shall briefly refer to a few of these dyes which have been or are in common use. Dyeing the hair was much practised by the Romans, and a kind of gold-dust was used by ladies who did not adopt borrowed locks.

One of the oldest natural dyes is that known as Henna. It consists of the dried leaves of the Egyptian privet,

Lawsonia inermis, N.O. Lythraceæ. The leaves (and the root) are made up into a paste for cosmetic purposes.

The paste is applied for, say, two hours to the scalp at a temperature of 45° C., under compresses of cotton maintained at a similar temperature. The tint subsequently darkens on exposure to the air, but the hair colouration is not uniform or satisfactory, because the dye does not penetrate into the hair; it is merely a surface-colouring agent.

The women of the East stain their nails, finger-tips and eyelids, and men use it to dye their beards. The reddish orange colour it imparts is not lasting, and is often deepened to black by the addition of other ingredients.

Walnut juice has also been used in the form of tincture or ointment. Chrysarobin stains the skin and hair, but is obviously inadmissible as a hair-dye.

For many years metallic preparations of Hg, Bi, Ag, and Pb were in vogue for dyeing hair by the formation of black sulphides. Several sittings are required, and the colour effects are not natural. Out of 21 samples examined (England and America), 14 were practically identical in their nature, containing sulphur suspended in a lead solution, and many were described as "perfectly harmless." The prices varied from 1s. to 6s. a bottle.

Two samples contained lead and thiosulphate of Na. The solution does not precipitate with KI, one of the ordinary tests for lead, and this fact is fraudulently advertised as a proof of absence of lead (Editorial in *Lancet*, 13th January, 1877).

As another example of metallic dye may be mentioned ammonio-nitrate of silver, with or without pyrogallol, which instantaneously reduces the silver salt to a black precipitate of metallic silver. These metallic dyes confer upon the hair an unnatural tint and a sheen, which varies with the light that falls upon it.

The oldest known artificial dye for textiles is picric acid, which was obtained from indigo in 1771. Picric acid quickly stains animal tissues—*e.g.*, wool, hair, skin—but

does not affect cotton. It is not, however, applicable as a hair-dye.

The colour of normal hair is mainly due to two factors—viz. (*a*), diffuse pigmentation of the shaft; (*b*) dark granular pigment, a form of melanin, a pigment devoid of iron. The proportions of these bodies vary much, and hence the diversity of shades. The intrinsic hair colour varies in concentration from bright yellow to blond and red. Colour is also influenced by the presence or absence of air in the cortex.

Increase of pigmentation is often associated with hyperkeratosis—*e.g.*, ichthyosis hystrix, moles, and acanthosis nigricans.

This granular pigment is bleached by H_2O_2 alone; the diffuse soluble pigment by H_2O_2 in presence of an alkali.

But modern hair-dressers have not been slow to avail themselves of the resources of organic chemistry, and the general tendency of modern dyeing is more and more in the direction of employing artificially prepared "synthetic dyes" which belong to the "aromatic" class—*i.e.*, are derivations of benzene.

Modern dyeing dates from 1856, when W. H. Perkin, aged 17, prepared the first aniline dye, mauve, based upon an accidental observation.

Let me call your attention to one or two of these newer dyes. The one most in favour appears to be a product termed para-phenylene diamine, $C_6H_4(NH_2)_2$ or, more shortly, diamido-benzol. This compound exists in three modifications—viz., ortho-, meta-, and para-forms.

The p-variety is coloured purple by $FeCl_3$; the m-form is coloured orange by $FeCl_3$, and is frequently used as a delicate test for nitrites, with which it forms "Bismarck brown" (tri-amido-azo-benzol).

P-phenylene diamine is extensively utilised for dyeing brown and black furs, and the wearing of these sometimes causes dematitis (Knowles, *Trans. Coll. Phys.*, Philadelphia, 1916).

Another substance, termed para-amido-phenol, may also

be employed as a dye (Rodinal), or its ally, Metol, used as a developer by photographers.[a]

Each of these substances is readily oxidisable, even in the air, but to ensure a rapid colouration it is customary to mix with the dye, ten minutes before application, an equal quantity of solution of H_2O_2. The peroxide not only activates the pigment, but also corrodes the surface keratin and renders it more permeable.

After thorough shampooing with soap and water, the mixture of peroxide and dye is carefully applied with a hard brush, and allowed to remain for half an hour, when the scalp is shampooed once more. The tint can be varied at pleasure by suitably arranging the concentration of the dye, and the gamut of colour runs from black to blonde or light brown. The colour will last about six weeks.

As Dr. Bunch points out, the staining of the hair by these dyes is very thorough, and penetrates not only as far as Huxley's sheath, but also colours in lesser degree the medulla.

All this would be well enough if the procedure were free from danger.

Yet no one who is acquainted with the chemical nature of these "aromatic" dyes would be surprised to hear of undesirable results following their use. As a matter of fact, there are serious risks attendant upon these compounds, both of a local and general character.

In Germany the sale of phenylene-diamine has been forbidden by law since 1906, nevertheless it is constantly introduced into the country from without. It is also prohibited in France and Austria.

Local Effects.—Many examples of severe dermatitis caused by phenylene-diamine are on record. The skin reaction may be slowly developed, and not ensue for days

[a] Benzene (benzol) ... ... C_6H_6.
Di-amido-benzol (Phenylene-diamine) ... $C_6H_4(NH_2)_2$.
Phenol (carbolic acid) ... ... C_6H_5, OH.
Amido-phenol ... ... C_6H_4, NH_2, OH.

or even weeks after the last application of the dye (*cf.* paper by Dr. Bunch on "Dermatitis Due to Hair-Dyes" (*Trans. of London Dermatological Society*, 1916, to which I am much indebted).

The whole face may become suddenly red and burning, the eyelids often swelling, so as to close the eyes. The skin assumes the appearance of a "weeping eczema," and the inflammation may extend to the neck and chest, or even spread over the whole body.

According to Dr. Bunch, the dermatitis is in most cases preceded by itching, but occasionally the skin lesions are not heralded by any such subjective sensations.

In the case of phenylene-diamine the intermediate irritant substance is stated to be quinone-diamine—$CH_6(NH)_2$, a by-product of its oxidation, and this substance has been shown experimentally to be a violent irritant. The final non-irritant product arising from the action of phenylene-diamine is called Bandrowski's base, and the darkening effect of the dye is due to this body (Bunch).

The hair should be thoroughly washed after the dye has been applied, the skin of the face and scalp having been previously protected by some fatty substance (Blascko, *Deut. med. Wochenschr*, 4th December, 1913; *Les Teintures Capillaires, à la p-phenylene-diamine*, par E. Rousseau; Paris, Legrand, 1914).

General Symptoms.—The local effects are apt to be bad enough, but worse may follow. Severe systemic poisoning has been noted—such as giddiness, tinnitus, muscular spasms, diarrhœa, and vomiting.

If 0.18 grm. per kilo of body-weight is given to a rabbit urgent symptoms are developed, and the animal soon dies.

Idiosyncrasy seems to play a considerable part in the effects, and some individuals are very susceptible to the poison.

Attempts have naturally been made to modify the toxic effects without impairing the power of colouration.

Dr. Bunch states that the modified solution most fre-

quently used by hairdressers in England is called "Inecto," while another dye, styled "Primal," contains sodium sulphite, and toluylene-diamine replaces phenyl-diamine, so that a minimum formation of quinone-diamine, or none, takes place. Another dye, called "Koorpa," contains phenylene-diamine, including the ortho-, meta-, and para-derivatives in the form of sulphates, and such a dye is less toxic.

EXHIBITS AND EXPERIMENTS.

Exhibits.

(1) Hair dyed by Henna.
(2) Hair dyed by ammonio-nitrate of silver.
(3) Action of picric acid on wool and cotton.
(4) Hair lightened in colour by H. .
(5) Specimens of phenylene-diamine, and amido-phenol.
(6) Hair dyed with each of these.
(7) Epidermis stained by chrysarobin.

LEAD POISONING AND BRIGHT'S DISEASE.

The Interim Industrial Reconstruction Committee for the Zinc and Spelter Industry has, with the approval of the Minister of Labour, been formed into a Joint Industrial Council. The Council will act as a Standing Consultative Committee to the Government on questions affecting the industry. The first meeting of the Council was held at the London Chamber of Commerce on Tuesday, May 13th, when the question of industrial diseases to which workers in this industry are liable was considered. Dr. T. M. Legge, of the Home Office, attended the meeting, and dealt particularly with the prevention of lead poisoning and Bright's disease. He stated that there had been a substantial reduction in the number of cases reported during recent years, owing to the great structural improvements that had been made in the various works, but he admitted that the decline was much less than might reasonably have been hoped for, and he invited both sides in the industry to co-operate in reducing the causes of the disease. He laid special stress on the vital importance of ventilation, as statistics showed that these diseases were almost entirely caused by the dust and fumes given off in the process of smelting. The following are the officers of the Council:—Chairman, C. H. Eden, Esq.; Vice-Chairman, James Wignall, Esq., M.P.; Secretary, C. Taylor, Esq., of the London Chamber of Commerce.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Chest Radiography at a Casualty Clearing Station, with Atlas. By R. Lindsay Rea, B.Sc., M.B.; late Superintendent X-ray Offices, 4th Army. Illustrated by 61 Figures. Belfast: Mayne, Boyd & Son, Limited; London: H. K. Lewis & Co., Limited. 1919. Cr. quarto. Pp. viii + 24, and Atlas.

The preface states that the primary object of this book is to help those engaged in *x*-ray work in Casualty Clearing Stations, where the convenience of modern hospital equipment is not forthcoming, and where the operator must needs make shift with what means he finds to hand.

The cessation of hostilities has dissolved the Casualty Clearing Station, but there are no doubt many radiographers engaged in out-of-the-way places with imperfect equipment who will derive benefit by studying the methods adopted by the 4th Army in mobile or semi-mobile hospitals.

The author quotes in his preface a most pertinent paragraph from Hænisch on the method of procedure necessary for accurately localising an embedded projectile, and stating that no localisation method can be applied in all cases as a routine—a conclusion with which we heartily concur.

The method most favoured by the author, though not in itself original, presents some interesting novelties. He uses a "plate" method with double exposure—the first, with closely adjusted diaphragm, giving an image of the projectile only; the tube is then shifted towards the centre of the body, the diaphragm widely opened, the second exposure giving anatomical structure, and a shadow of the projectile as displaced by the tube shift. The depth is

then estimated by means of a chart or localising scale, and the anatomical position is then determined on the appropriate slab of Prof. Symington's atlas of horizontal frozen sections.

This atlas is undoubtedly of great use in assisting the radiographer to convey his findings intelligibly to the surgeon. Mr. Rea is not the only radiographer who has so used it. We have seen it in use in the Birmingham X-ray Departments.

We were interested to find that the author has been in the habit of estimating the quantity of fluid in the pleural cavity by the density of the shadow cast. This method must entail always using tubes of like penetration. In the hands of an experienced radiographer, sure of his technique, it may be valuable; we should not recommend it to a novice.

Though primarily intended for war workers, this short volume will repay perusal by radiographers in civil practice. It is illustrated by some 58 plates, creditably reproduced. W. G. H.

Manual of Bacteriology. By Robert Muir, M.A., M.D., Sc.D., F.R.S.; and James Ritchie, M.A., M.D., F.R.C.P. (Ed.). Seventh Edition. London: Henry Frowde and Hodder & Stoughton; Oxford University Press. 1919. Cr. 8vo. Pp. xiv + 753.

Muir and Ritchie's Manual of Bacteriology is probably the best-known book on the subject in the English language, and the fact that it has already gone through six editions speaks for itself. The popularity of the work is due to its convenient size, and to the quantity of solid information conveyed in its 750 closely printed pages. The treatment of the subject is practical throughout, and it is this quality that makes the book the admirable students' handbook it is. In fact, a copy of "Muir and Ritchie" is almost as much a "property" of any well-appointed "lab." as is the autoclave or the incubator.

The new matter in this last edition deals mainly with the work done by bacteriologists in connection with the war.

This has entailed some revision of our views with regard to cerebro-spinal fever, tetanus, and other pathogenic anaerobies, and intestinal affections; while new sections have been added on infective jaundice, trench fever, and encephalitis lethargica.

This edition appears with its usual good print, clean-cut illustrations (some of them new), and very full bibliography and index.

The Forms of Alcoholism and their Treatment. By HUGH WINGFIELD, M.A., M.D., B.C. Cantab. London: Henry Frowde and Hodder & Stoughton. 1919. Cr. 8vo. Pp. 76.

THIS is a useful little book, strictly confined to its subject, tempting by-ways being avoided. The other adopts Dr. Archdall Reid's theory that primitive man was universally liable to the particular effect of alcohol that leads to excessive drinking. After the introduction of alcohol evolution acted by eliminating many by death, and others through impotence in the male, so the number liable to violent intoxication became reduced. Instances of atavism, however, are found occasionally to occur, and the alcoholic is in effect an individual who, as regards alcohol, has returned more or less to the condition of his remote ancestors.

This theory explains why alcoholism is so often hereditary, why once acquired it is so permanent, and why hereditary drunkenness does not presuppose the handing down of an acquired characteristic.

Dr. Wingfield divides alcoholism into four classes:—

1. Pseudo-dipsomania. The primitive type, where if alcohol is taken irresistible craving is invariably excited and the patient drinks to excess for a week or two.

2. Chronic Sober Alcoholism. Regularly drinks to excess, but never intoxicated, unless by accident.

3. Chronic Inebriate Alcoholism. Patient is never sober.

4. True Dipsomania. The craving occurs spontaneously and does not need alcohol to excite it.

Total abstinence is the only cure, not only for pseudo-dipsomania, but in chronic alcoholism and true dipsomania, as the chronic alcoholic who touches alcohol at all nearly always relapses into his former habits.

Treatment by seclusion, by drugs, and by suggestion are shortly but clearly discussed.

Applied Anatomy: The Construction of the Human Body considered in relation to its Functions, Diseases, and Injuries. By Gwilym G. Davis, M.D., Professor of Orthopædic Surgery in the University of Pennsylvania, &c. Fifth Edition. Philadelphia and London: J. B. Lippincott Company. 1918.

In spite of the statement that "the present edition contains numerous corrections and additions, both to the cuts and text," the fifth edition of Dr. Davis's book appears to the ordinary observer to be practically a reprint of the third edition, issued in 1915. The work is undoubtedly a very useful one, and its arrangement is excellent. It must be admitted, however, that many of the illustrations need correction, or strengthening, and that several are somewhat misleading. For example: Figure 134, which is a "view of the pharynx looking forward"—the posterior wall having been removed—shows the "faucial" tonsil lying behind the posterior pillar of the fauces; figures 19 and 25 give misleading views of the relationships of the fourth and sixth cranial nerves with regard to the base of the skull and the dura mater; while figure 360 illustrates a very unusual arrangement of the flexor carpi ulnaris tendon.

The experience of the war would lead us to expect the

present edition to have furnished more detailed information as to the results of injury to the various limb nerves. Also, recent advances in our knowledge of the abdominal viscera, due to *x*-ray methods of examination, might suitably find a mention in a work bearing the title of Dr. Davis's book.

The Anatomy of the Peripheral Nerves. By A. Melville Paterson, M.D., F.R.C.S.; Lieut.-Col., R.A.M.C.; Prof. of Anatomy, University of Liverpool. London: Henry Frowde and Hodder & Stoughton. 1919. Demy 8vo. Pp. xi + 165.

The object of the late Professor Paterson's book is "to provide a brief account of the peripheral nerves for the use of students and surgeons, particularly for those engaged in military orthopædic work." The well known facts regarding nerve distribution alone are introduced, and all controversial matter is omitted. An attempt is made to illustrate the usual levels at which the nerves to the various muscles spring from the main nerve trunks. At the same time the reader is warned that caution must be used in regard to these illustrations, inasmuch as great individual variation exists. In the case of each muscle the spinal segments from which its nerve supply is derived can be seen at a glance from text. The work is undoubtedly a most useful one, and the only regret is that more care has not been taken in reproducing the illustrations, many of which (Figs. 42 and 62 for instance) are much spoiled by the crude manner in which they are printed.

Transactions of the American Pediatric Society. Edited by Oscar M. Schloss, M.D. Twenty-Ninth Session, Held at the Greenbriar, White Sulphur Springs, W.Va., May 28, 29 and 30, 1917. Volume XXIX.

All practitioners are interested in children's diseases; and it is an unfortunate fact that they are not more carefully observed and diligently studied. And it is an extraordinary

thing that mothers consult midwives, nurses, pharmacists and others for infants' ailments; therefore, we hail the formation of pædiatric societies and of their transactions. Of these latter, there is none that embraces a wider field of observation or produces a more valuable contribution to the clinical history, pathology and therapeutics of children's diseases than the American Pediatric Society. The volume (XXIX.) to hand contains 33 papers, which deal not only with anomalous forms of disease but also with many of the more common forms. Dr. Charles Herrman reports "three children with sporadic cretinism in one family." "Enlargement of the Thymus" is the title of Dr. Friedlander's paper; and Dr. Griffith describes and illustrates by photograph and skiagraph a typical case of that rare disease among infants, idiopathic dilatation of the colon, as found in a boy four years old, whose previous condition and general health had always been excellent. A case of perforated appendix with a large fæcal accumulation occurring in an infant nine months old is reported by Dr. Abt.

"Poliomyelitis" is the title of a paper by Dr. Carr, who, under this heading, gives an account of the epidemic of 1916 in New York, during which time he admitted 63 cases to hospital. He describes three types of cases in those under his treatment :—

1. Very mild cases, with a slight rise of temperature, with the neck a little stiff and painful, but without any definite paralysis.

2. Very irritable and restless, or irritable and stuporous; one or more groups of muscles affected, weak or paralysed, and reflexes absent, or in a few cases exaggerated.

3. Stuporous or comatose cases, with marked general weakness, and shallow, jerky respirations.

Medicinal treatment was largely symptomatic.

Twelve cases died, 6 cases were very slightly benefited, 33 cases were improved, and 12 left cured. Many other papers deserve extended notice did space admit of it. One great charm the book has—to wit, a good index.

Mammalian Anatomy, with Special Reference to the Cat. By ALVIN DAVISON, Ph.D. Third Edition, revised by FRANK A. STROMSTEN, D.Sc. Philadelphia: P. Blakiston, Son & Co. [No date.]

DR. STROMSTEN'S edition of Davison's Mammalian Anatomy is an excellent, concise text-book for students beginning the study of Medicine or Natural Science. The main facts are clearly stated, and minute details are omitted. The various chapters into which the book is divided are followed by a series of questions, which will enable the student to determine whether he has recognised the important matters dealt with. The book is essentially a laboratory text-book, yet many interesting facts dealing with classification and with physiology are included. The directions for dissection and for the preparation of the organs and parts are given in a direct and lucid manner.

Elements of Surgical Diagnosis. By SIR ALFRED PEARCE GOULD, K.C.V.O., M.S. Lond., F.R.C.S. Eng.; and ERIC PEARCE GOULD, M.D., M.Ch. Oxon., F.R.C.S. Eng. Fifth Edition, revised. With 16 Radiographic Plates. London: Cassell & Co., Ltd. 1919. Cr. 8vo. Pp. xiv + 722.

THIS volume, which has for some time been out of print, has been brought thoroughly up to date. It now embodies the advances that have been made in the diagnosis of surgical affections in connection with War Surgery.

Much new matter has been added on such subjects as gas-gangrene and causalgia. At the same time the descriptions of diagnostic methods that have become obsolete owing to the extended use of *x*-rays and laboratory processes have been omitted. The net result is that no increase has had to be made in the number of pages—a feature of a new edition which will not be unwelcome to students.

The growing importance of *x*-rays in surgical diagnosis is recognised by the addition of many new radiograms.

"*Eyes Right.*" By James M. MacPhail, M.A., M.D., India. Calcutta : Butterworth & Co., Ltd. 1919. Cr. 8vo. Pp. v + 75.

This little pamphlet outlines for the lay public the various pathological conditions which may be met with in the human eye, and the best methods, both preventive and curative, which may be employed in combating them.

At the present time, when the far-reaching importance of Preventive Medicine is becoming universally recognised, such a pamphlet is most valuable, and we can heartily recommend this one to those for whom it has especially been written—*e.g.*, parents and teachers.

We can congratulate the author in having succeeded in making his explanations of the functions and structure of the eye both clear and brief, and in covering such a wide range in his recital of possible pathological conditions.

The chapters on hygiene and refraction are especially useful. The latter subject might readily be further elaborated in a later edition.

Pocket Notes on Nerves. Compiled and arranged by T. Muirhead Martin, M.D., C.M. (Edin.), &c. Edinburgh : William Bryce. 1919. Cr. 8vo. Pp. 58.

It is a pity that the usefulness of these "Pocket Notes on Nerves" should be marred by careless reading of the proof-sheets while the book was passing through the press. Nearly every page is disfigured by printers' errors, and the spelling of the names of the authorities is atrocious—Laundry, Friedrich, Felchig, Majendi, Bundach, Flechig, Meckle, Munro : truly, a queer collection of authorities, unknown to fame when so deprived of their patronymics.

Allowance being made for these misspellings of proper names and for an unusual number of printers' errors of another kind in the text, the Pocket Notes are really very good, and show a wide acquaintance on the author's part with the applied anatomy of the nervous system.

In a brief introduction, Dr. T. S. A. Orr, M.B., of London, points out that the book will be found especially useful at the present time when so many cases of functional nervous disease in connection with military service have to be dealt with—frequently by medical men whose experience has included few cases of nervous disease. We quite agree. But it is to be hoped that the pages of a second edition, to be called for—let us hope—at no distant date, will be freed from the imperfections to which we have drawn attention in no spirit of carping criticism—rather, indeed, in the author's interest, and because the subject-matter is so good on the whole.

King Edward VII. Sanatorium, Midhurst. Eleventh Annual Report, July, 1916, to July, 1917. Pp. 16.

The shadow of war has been cast over the work of the King Edward VII. Sanatorium as it has been over that of every similar institution in the kingdom. Faced by the difficulties of a depleted staff, the management has "carried on," and 340 patients were admitted during the twelve months ending June 30th, 1917.

Statistical tables have been a feature of the reports of this institution in past years, and those appended to the report before us continue a record which is of much value. In 1914 a grant was made by the Medical Research Committee for the purpose of carrying out an investigation into the data available for the determination of the rate of mortality amongst patients discharged from the sanatorium as compared with that of the general population of a corresponding age. The patients dealt with were discharged from the sanatorium between January 1st, 1907, and December 31st, 1914—in all, about 1,800 cases. As part of this scheme of research, the necessary data have been tabulated regarding the comparative rate of mortality of 352 selected cases, for the most part treated with tuberculin, and the comparative rate of mortality of 384 selected comparable cases treated without tuberculin. The report

has not yet been published, but we are told that its preparation is well advanced, and that the facts brought to light are of considerable interest. We trust that we may have the opportunity of studying it in due course.

Electro-Diagnosis in War: Clinical, Medical Board Technique and Interpretation. By A. Zimmern, Professeur Agregé of the Faculty of Paris; and Pierre Perol, formerly Intern of the Hospitals of Paris. Edited, with a Preface, by E. P. Cumberbatch, M.A., M.R.C.P., B.M. (Oxon.); Medical Officer in Charge, Electrical Department, St. Bartholomew's Hospital, &c. London: University of London Press, Ltd.; Paris: Masson et Cie. 1918. Cr. 8vo. Pp. xxiv+212.

This is one of the Military Medical Annuals, edited by Sir Alfred Keogh.

The object of the book is to describe fully the value of and necessity for accurate electrical testing in cases of nerve lesions, &c. The first chapter, dealing with technique, is followed by a short description of the anatomy of the motor points, &c. These latter are illustrated on the muscles in a manner which simplifies their memorisation.

The various abnormal reactions, quantitative and qualitative, are next dealt with, and the reaction of degeneration, partial and complete, is fully explained. The authors insist on the necessity of repeated examinations, pointing out that a partial R. D. may be a stage towards total degeneration or a stage towards recovery.

A strong plea is entered for the adoption of a uniform technique: for faradic tests, a standard coil with 4 volts in the primary circuit: a fine wire, secondary: and a tetanising current, using the bipolar method, are suggested. For galvanic tests, the "threshold" current should be the standard. The condenser method and chronaxie are also fully explained in their application and interpretation of results.

The application of these methods to motor paralysis is then fully explained; while Chapter IV. is devoted to disorders of sensation and the special senses, describing electrical methods, whereby such disorders can be measured from time to time.

Chapter V. gives a clear account of the various reactions —nystagmus, vertigo, angular deviation—which follow galvanic applications to the head, traversing the internal ear.

The book is clearly written, very readable, and contains in a short space a great deal of very useful information.

W. G. H.

Hypnotic Suggestion and Psychotherapeutics. By A. Betts Taplin, L.R.C.P. and L.M. (Edin.). Liverpool: Littlebury Bros. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. 1918. Cr. 8vo. Pp. 166.

It is rare and refreshing to come across a book on Suggestion which can be so heartily recommended as the present volume. The author has avoided, with the apparent ease of skill, the extremes which are so tempting to writers on these subjects.

The sections on Psychoanalysis, Hypnotic Suggestion, and Christian Science are of especial interest. In comparing the two former, it is the opinion of the writer that "Hypnotic Suggestion stands first in point of general efficacy, and the future of Psychoanalysis depends solely upon whether its mode of application can be simplified and greatly curtailed by further experience." Under the heading of Hypnotic Suggestion are discussed the relation between it and Persuasion or Re-education, and the methods of employing each; while the article on Christian Science is short, sharp, and to the point.

Throughout, the book is written in a pleasing style, and while not too advanced for those who wish to be introduced to the subject, affords many hints to those who are engaged in the practice of this most fascinating branch of therapeutics.

Practical Obstetrics. By E. Hastings Tweedy, F.R.C.P.I., Professor of Obstetrics, R.C.S.I., &c.; and G. T. Wrench, M.D. Fourth Edition. London: Henry Frowde and Hodder & Stoughton. Pp. 557 + xxi. 1919.

The new edition of Tweedy and Wrench is well up to the standard of its predecessors. Among the novelties are—(1) A short chapter on Anatomy, in which Dr. Tweedy seizes the opportunity of bringing forward his views on the "tendons of the uterus;" (2) a new treatment for concealed accidental hæmorrhage; (3) an excellent illustration of the vagina plugged for the treatment of accidental hæmorrhage.

In the appendix will be found two important monographs. The first is on eclampsia, the second is on the lower uterine segment.

Since its publication, during the Mastership of Dr. Tweedy, this book has become the *sine quâ non* for those who need a practical work, written in a most interesting style, and it will be necessary for those who wish to keep pace with the times to purchase and to "digest" the present edition. B. S.

Pye's Surgical Handicraft: A Manual of Surgical Manipulations, Minor Surgery, and other Matters connected with the Work of House Surgeons and Surgical Dressers. Edited, and largely rewritten, by W. H. Clayton-Greene, B.A., M.B.B.C. (Camb.); F.R.C.S. (Eng.); Surgeon to St. Mary's Hospital; Lecturer on Surgery in the Medical Schools, &c. Eighth Edition, fully revised, with some additional Matter and Illustrations. Bristol: John Wright & Sons, Ltd.; London: Simpkin, Marshall. 1919. Demy 8vo. Pp. xvi + 639.

The popularity of this work is the best proof of its value. The new addition contains much of value and interest. The lessons learnt in the war are incorporated, bringing the new edition up to date. H. S.

PART III.
MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

SANITARY AND METEOROLOGICAL NOTES.

Vital Statistics.

For four weeks ending Saturday, April 19, 1919.

IRELAND.

The average annual death-rate represented by the deaths—exclusive of deaths of persons admitted into public institutions from without the respective districts—registered in the week ended Saturday, April 19, 1919, in the Dublin Registration Area and the eighteen principal provincial Urban Districts of Ireland was 25.8 per 1,000 of the aggregate population, which for the purposes of these returns is estimated at 1,142,268. The deaths from all causes registered in the week ended Saturday, April 19, and during the period of four weeks ended on that date, respectively, were equal to the following annual rates per 1,000 of the population :—Nineteen Town Districts, 19.9 and 25.8 ; Dublin Registration Area, 22.8 and 28.0 : Dublin City, 22.7 and 28.8 ; Belfast, 17.0 and 22.4 : Cork, 19.0 and 26.2 ; Londonderry, 24.2 and 39.8 ; Limerick, 19.0 and 21.7 ; and Waterford, 20.9 and 25.7.

The deaths from certain epidemic diseases—namely, enteric fever, typhus, small-pox, measles, scarlet fever, whooping-cough, diphtheria, dysentery, and diarrhœal diseases—registered in the nineteen town districts during the week ended Saturday, April 19, 1919, were equal to an annual rate of 0.6 per 1,000. Among the 131 deaths from all causes in Belfast were 2 from diarrhœal diseases. Included in the 28 deaths from all causes for Cork is 1 from typhus. Of the 19 deaths from all causes in Londonderry 1 was from whooping-cough, 1 was from measles and 1 was from typhus. One of the 8 deaths in Lisburn was due to dysentery. Included in

5 deaths recorded in Sligo was 1 from measles. One of the 5 deaths in Kilkenny was due to whooping-cough.

DUBLIN REGISTRATION AREA.

The Dublin Registration Area consists of the City of Dublin as extended by the Dublin Corporation Act, 1900, together with the Urban Districts of Rathmines, Pembroke, Blackrock, and Kingstown. The estimated population of the area is 405,000.

In the Dublin Registration Area the births registered during the week ended April 19, 1919, amounted to 145—73 boys and 72 girls, and the deaths to 193—80 males and 113 females.

DEATHS.

The deaths registered, omitting the deaths (numbering 16) of persons admitted into public institutions from localities outside the Area, represent an annual rate of mortality of 22.8 per 1,000 of the population. The rate for all deaths registered during the sixteen weeks of 1919 ended April 19 was 36.2, while in the corresponding period of the preceding ten years, 1909-1918, it had been 25.9.

The 177 deaths appertaining to the Area included 3 from whooping-cough and 1 from diarrhœa and enteritis of a child under 2 years. There were 20 deaths from influenza, being equivalent to an annual rate of 2.6 per 1,000 of the population. Of these 12 belonged to the City, affording a rate of 2.0 per 1,000 of the population, including 5 (or 1.6 per 1,000) assigned to North City Districts and 7 (or 2.5 per 1,000) to South City Districts. Eight deaths from influenza (or 4.4 per 1,000 of the population) were referred to the Urban Districts. In the three preceding weeks deaths from this cause in the Registration Area had numbered 34, 41 and 23, respectively.

Deaths attributed to pneumonia were 22 in number (comprising 8 from broncho-pneumonia, 2 from lobar pneumonia, and 12 from pneumonia, type not distinguished), as against 37, 34, and 24 in the three weeks preceding.

Tuberculosis caused 31 deaths as against 28, 41, and 23, respectively, in the three weeks preceding. Of the 31 deaths ascribed to tuberculosis, 20 were referred to pulmonary tuberculosis, 6 to tubercular meningitis, and 5 to other forms of tuberculosis.

Nine deaths were caused by cancer, 17 by organic diseases of the heart, and 22 by bronchitis.

Among the deaths of infants under one year old, whooping-cough caused 1, influenza 1, tubercular disease 2, convulsions 3, bronchitis 4, pneumonia 1, broncho-pneumonia 2, diarrhœa and enteritis 1, premature birth 2, and congenital debility 2.

Thirty-four of the deaths registered during the week appertaining to the Area were of children under 5 years of age, 22 being of infants under one year, of whom 7 were under one month old. Sixty-three (63) deaths of persons aged 65 and upwards were registered, including 44 deaths of persons of 70 years or upwards.

Of the 177 recorded deaths 63 occurred in hospitals and other public institutions.

There were 5 deaths by accident, 2 of which were caused by drowning.

Cases of Infectious Diseases under Treatment in Dublin Hospitals.

The cases admitted to hospital during the week ended April 19, 1919, and the cases under treatment at its close, respectively, were as follow:—Enteric fever, 1 and 6; measles, 9 and 15; scarlet fever, 2 and 35 (exclusive of 9 convalescents at Beneavin, Glasnevin, the Convalescent Home of Cork Street Hospital); and diphtheria, 1 and 12. Nineteen cases of pneumonia were admitted during the week, and 54 remained under treatment at its close. Of the deaths in hospital recorded during the week, 5 were from pneumonia.

ENGLAND AND SCOTLAND.

The mortality among civilians in the week ended Saturday, April 19, 1919, in 96 large English towns (including London, in which the rate was 14.1) was equal to an average annual death-rate of 14.3 per 1,000 persons living. The average rate for 16 principal towns of Scotland was 15.3 per 1,000, the rate for Glasgow being 16.1, and that for Edinburgh 16.3.

METEOROLOGY.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of April, 1919.

Mean Height of Barometer, - - -	30.010 inches.
Maximal Height of Barometer (20th, at 9 p.m.),	30.704 ,,
Minimal Height of Barometer (14th, at 5 p.m.),	28.583 ,,
Mean Dry-bulb Temperature, - -	46.3°.
Mean Wet-bulb Temperature, - -	43.0°.
Mean Dew-point Temperature, - -	39.3°.
Mean Elastic Force (Tension) of Aqueous Vapour,	.24 5 inch
Mean Humidity, - - - -	77.1 per cent.
Highest Temperature in Shade (on 19th), -	62.8°.
Lowest Temperature in Shade (on 2nd), -	32.0°.
Lowest Temperature on Grass (Radiation) (2nd)	28.0°
Mean Amount of Cloud, - - -	61.9 per cent.
Rainfall (on 17 days), - - -	0.898 inch.
Greatest Daily Rainfall (on 26th), - -	0.221 ,,
General Directions of Wind, - -	W., W.S.W.

Remarks.

April, 1919, was a month of average mean temperature (47.2° compared with a thirty-five years' average of 47.3°,, but with considerable extremes. For example, the mean of the 19th was as high as 56.8°; that of the 27th was only 38.8°. The wind blew with much persistence and strength from westerly points of the compass (between S.W. and N.N.W.). The rainfall in Dublin was scanty, but frequent. The 27th and 28th were bitterly cold days, a piercing N wind, strong to a gale, carrying blizzards of snow and hail at intervals on the former of these two days, on which isobars for northerly winds ran almost from Spitzbergen to the Azores.

The dawn of spring took place in the week ended April 12th, but a relapse into winter quickly followed on the 14th, when an exceedingly deep and energetic depression passed rapidly across Ireland from the Atlantic to the Irish Sea. In this disturbance the barometer fell in Dublin to 28.583 inches at 5 p.m. of the 14th, about which time hail-showers occurred and thunder was heard.

After a brief warm spell from the 17th to the 22nd, the weather again became cold, and daily more wintry, until the

27th and 28th, which were phenomenally severe for the season. Throughout those days snow lay deep on the Dublin and Wicklow Mountains.

In Dublin the arithmetical mean temperature (47.5°) was 0.1° under the average (47.6°). The mean dry-bulb readings at 9 a.m. and 9 p.m. were 46.3°. In the fifty years ended with 1915, April was coldest in (1879 the cold year) (M. T. = 44.5°), in 1887 (the dry year) M. T. 43.9°, and in 1917, when the M. T. was only 43.8°, so establishing a record for coldness; and warmest in 1893 (M. T. = 51.4°). In 1918 the M. T. was 45.9°.

The mean height of the barometer was 30.010 inches, or 0.160 inch above the average value for April—namely, 29.850 inches. The mercury rose to 30.704 inches at 9 p.m. of the 20th and 9 a.m of the 21st, and fell to 28.583 inches at 5 p.m. of the 14th. The observed range of atmospheric pressure was, therefore, 2.121 inches.

The mean temperature deduced from daily readings of the dry-bulb thermometer at 9 a.m. and 9 p.m. was 46.3°, or 7.1° above the value for March, 1919. Using the formula, *Mean Temp.* = *Min.* + (*Max.*—*Min.*) × .476, the value is 47.2°, or 0.1° in defect of the average mean temperature for April, calculated in the same way, in the thirty-five years, 1881-1915 (47.3°). The arithmetical mean of the maximal and minimal readings was 47.5°, compared with a thirty-five years' (1881-1915) average of 47.6°. On the 19th the thermometer in the screen rose to 62.8°—wind, W.S.W.; on the 2nd the temperature fell to 32.0°—wind, W. The minimum on the grass was 28.0°, also on the 2nd. The mean maximal temperature was 53.6°, the mean minimal temperature was 41.3°.

The rainfall was 0.898 inch, distributed over 17 days. The average rainfall for April in the thirty-five years, 1881-1915, was 1.900 inches, and the average number of rain-days was 16. The rainfall therefore was much below the average, whereas the number of rain-days was 1 in excess. In 1877 the rainfall in April was very large—4.707 inches on 21 days. On the other hand, in 1873, only 0.498 inch was measured on 8 days. In 1914, only 0.719 inch fell on 11 days, and in 1917, only 0.896 inch fell on 12 days.

High winds were noted on 12 days, and reached the force of a gale (8) on the 27th. Hail fell on the 1st, 8th, 13th, 14th, 26th, and 27th; snow fell on the 1st and 27th. Thunder

was heard to eastward at 6 p.m. of the 14th. Solar halos were seen on the 2nd, 13th, 15th, and 21st; lunar halos or coronæ on the 8th and 9th. The temperature rose to 60° in the screen on 3 days. It failed to reach 50° on the 1st, 2nd, 27th, 28th, and 29th. It fell to 32° in the screen on the 2nd, and was below 32° on the grass on the 1st, 2nd, 22nd, 27th, 28th, and 29th. The mean lowest temperature on the grass was 37.6°, compared with 30.8° in 1915, and 31.6° in 1887.

The rainfall in Dublin during the four months ending April 30th amounted to 7.127 inches on 78 days, compared with only 4.700 inches on 59 days in 1911, 10.014 inches on 84 days in 1916; 6.882 inches on 65 days in 1917; 6.403 inches on 60 days in 1918; an average of 8.338 inches on 69 days in the first decade of the twentieth century, and a thirty-five years (1881-1915) average of 8.020 inches on 67 days.

At the Normal Climatological Station in Trinity College, Dublin, Mr. A. W. Boyce reports that the mean value of the readings of the barometer at 9 a.m. and 9 p.m. was 30.016 inches. Pressure ranged from 28.675 inches at 9 p.m. of the 14th to 30.715 inches at 9 a.m. of the 21st. The mean dry-bulb temperature at 9 a.m. and 9 p.m. was 47.4° The arithmetical mean of the daily maximal and minimal temperatures was 47.4°. The screened thermometers rose to 63° on the 19th and 22nd, and fell to 32° on the 2nd. On the 2nd and 22nd the grass minimum was 23°. Rain fell on 15 days to the amount of 0.90 inch, the greatest fall in 24 hours being 0.21 inch on the 26th. The duration of bright sunshine, according to the Campbell-Stokes recorder, was 131.9 hours, of which 10.6 hours occurred on the 16th, and 11.5 hours on the 20th. The mean daily sunshine was 4.4 hours. The mean temperature of the soil at 9 a.m. was 46.6° at a depth of 1 foot; at a depth of 4 feet it was 43.7°.

The Editor expresses his acknowledgment to the following observers for information as to rainfall and other weather data:—Captain Edward Taylor, D.L., Ardgillan, Balbriggan, Co. Dublin; Mr. T. Bateman, Malahide, Co. Dublin; Mr. J. Pilkington, Stirling, Clonee, Co. Meath; Miss Mary Love, Cheeverstown, Clondalkin, Co. Dublin; The Commandant, Ordnance Survey Office, Phœnix Park, Dublin; Mr. F. Dudley Joynt, Donnybrook, Dublin; Mr. Harold Fayle,

Sandford Lodge, Ranelagh, Dublin; Dr. Arthur S. Goff, Dundrum Castle, Co. Dublin; Mr. W. J. M'Cabe (for the Right Hon. L. A. Waldron, D.L.), Killiney, Co. Dublin; Miss Armstrong, Rathdown House, Greystones, Co. Wicklow; Mrs. Sydney O'Sullivan, Auburn, Greystones; Dr. F. O'B. Kennedy, Royal National Hospital, Newcastle, Co. Wicklow; Mr. H. V. Macnamara, D.L., Ennistymon, Co. Clare; Mrs. E. Davis, Castleconnell, Co. Limerick; and the Rev. Canon Arthur Wilson, Dunmanway, Co. Cork.

Ardgillan.—Rainfall, 1.25 inches, on 18 days. Average, 1.91 inches on 15 days. Maximum in 24 hours, 0.33 inch on 26th. In April, 1897, 3.61 inches fell; in April, 1901, only 0.98 inch of rain was recorded. Maximal temperature in shade, 64.6° on 19th; minimum, 30.2° on 8th.

Days of frost in shade, 4; of frost on grass, 17.

Malahide.—Rainfall, 0.985 inch on 11 days. Maximum, 0.33 inch on 26th.

Clonee.—Rainfall, 1.38 inches, on 18 days. Maximum, 0.27 inch on 26th. Rainfall since January 1, 10.41 inches on 84 days.

Phœnix Park.—Rainfall, 1,208 inches, on 17 days. Maximum, 0.248 inch, on 14th and 25th. Total amount of sunshine was 152.3 hours, the most being 12.3 hours, on 20th and 22nd.

Cheeverstown.—Rainfall, 1.33 inches, on 16 days. Maximum, 0.33 inch on 14th.

Donnybrook.—Rainfall, 0.790 inch, on 14 days. Maximum, 0.220 inch on 26th.

Ranelagh—

Mean corrected Height of Barometer,	30.020 inches
Highest corrected Reading (20th, 21 hours),	30.71 ,,
Lowest corrected Reading (14th, 17 hours),	28.59 ,,
Mean Dry-bulb Temperature,	46.5°
Mean Wet-bulb Temperature,	43.9°
Mean Vapour Pressure,	0.257 inch
Mean Humidity,	82 per cent.
Mean Maximal Temperature,	53.8°
Mean Minimal Temperature,	40.2°
Arithmetical Mean Temperature,	47.0°
Highest Temperature in Screen (19th),	63°
Lowest Temperature in Screen (2nd, 22nd, 29th)	31°

Lowest Temperature on Grass (2nd),	21°
Nights of Ground Frost,	12
Rainfall on 13 days	0.78 inch
Greatest Daily Rainfall (26th),	0.23 ,,
Mean Amount of Cloud,	67.8 per cent.
Days of Clear Sky,	5
Days of Overcast Sky,	15
General Directions of Wind,	W. to N.W.

Remarks.—A favourable month on the whole, with very low rainfall. There was a short cold spell at the close, but the mean temperature was higher than in April, 1917 or 1918.

Dundrum.—Rainfall, 0.93 inch, on 16 days. Maximum, 0.20 inch on 27th. Mean shade temperature, 49.8°; maximum, 71° on 16th; minimum, 32° on 1st and 2nd. Hail and snow showers on 1st, 17th, 26th, and 27th.

Killiney.—Rainfall, 1.10 inches, on 7 days. Maximum, 0.27 inch, on 15th. On the 26th, 0.26 inch was measured. Average at Cloneevin, Killiney (24 years, 1885-1908), 1.870 inches, on 15 days.

Greystones (Rathdown House).—Rainfall, 1.38 inches on 15 days. Maximum, 0.36 inch on 14th. Hail fell on the 8th, 15th, 26th and 27th; snow on the 26th and 27th.

Greystones (Auburn).—Rainfall, 1.15 inches on 11 days. Maximum, 0.35 inch on 14th.

Newcastle.—Rainfall, 1.07 inches on 14 days. Maximum, 0.31 inch on 26th. Mean temperature, 45.8°; maximum, 61° on 11th and 18th; minimum, 30° on 27th; mean maximum, 52.2°; mean minimum, 39.4°.

Ennistymon.—Rainfall, 1.78 inches on 20 days. Maximum, 0.27 inch on 26th.

Castleconnell.—Rainfall, 1.85 inches on 16 days. Maximum, 0.28 inch on 9th.

Dunmanway.—Rainfall, 3.02 inches on 19 days. Maximum, 1.01 inches on 14th. Besides this, 0.49 inch fell on 13th, and 2.58 inches from the 7th to the 14th, inclusive. The observer writes:—"The first six days were warm and bright, and so were the days from the 18th to the 22nd. Very cold N. and N.E. winds prevailed during the last eight days, which were very cold, with bright sunshine. Bright sunshine, strong winds, night frosts and heavy hail-showers were the characteristics of the month."

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